SOCIODEMOGRAPHIC AND CLINICAL DETERMINANTS OF QUALITY OF LIFE IN URBAN POPULATION OF POLAND

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SUMMARY

The aim of the study was to assess quality of life (QL) of residents of Polish urban area and analyze the influence of selected sociodemographic and clinical variables on their QL. The study revealed a very high level of reported problems, especially regarding pain and anxiety. The mean subjective assessment of health state was poor in comparison with results obtained in other (usually western) countries. Presence of major risk factors of cardiovascular diseases had an important impact on QL. Elevated blood pressure and unsatisfactory level of physical activity were the strongest factors deteriorating QL in the studied population. There is a need for implementing effective interventions in the society, especially in the area of prevention and management of hypertension and sedentary lifestyle.

INTRODUCTION

Quality of life (QL) has been widely perceived as an important end point in therapeutic management and overall public health issues. As funds for the provision of health care are scarce, quality of life assessments are increasingly being used for clinical decision making and resource allocation. Periodic reassessment of changes in health can provide important data on benefits and disbenefits of health care and the extent to which the population is achieving national targets for health.

Despite the extensive use of the phrase quality of life, there is, as yet, little agreement as to its precise definition, and the quantitative evaluation and methodology may therefore vary. Quality of life refers to a highly subjective perception of physical, social as well as psychological well-being and reflects patient's personal values, beliefs and life satisfaction (1). Thus, there is general consensus that QL measures should include a minimum of five attributes: physical and social functioning, emotional and mental status, burden of symptoms and perceptions of general well-being (2). While assessing the subjective health state a particular emphasis should be also put on factors influencing patient's perception of quality of life.

Quality of life is still a new and underestimated issue in Poland with relatively little attention paid to measurements of subjective health in general population. This study was designed to investigate quality of life of residents of Polish urban area with a focus on determining the most important demographic and clinical variables influencing peoples' subjective health state and QL.

SUBJECTS AND METHODS

The study sample was randomly selected of residents (aged 18-64 years) of two Polish urban areas - Łódź (ca 790,000 citizens) and Toruń (ca 200,000 citizens). A total of 6,800 personal invitations to the study was sent by mail. With the response rate 55 %, the study enrolled 3,723 individuals, 1,822 women and 1,901 men. There were 913 persons in the youngest age group (18-29 years), 604 persons aged 30-39 years, 963 persons aged 40-49 years and 1,243 persons in the oldest age group (50-64 years). The investigation procedure took place in selected out-patient clinics and consisted of three parts: an interview (age, marital state, education, employment, smoking behaviour, physical activity level, any diagnosed health problems and regular treatment), a physical examination (blood pressure and anthropometric measurements) and a blood sample collection (assessment of total cholesterol concentration). Data were collected as a part of the Countrywide Integrated Noncommunicable Diseases Intervention Program (CINDI) for World Health Organization's Regional Office in Europe (3). Methods were standardized according to WHO guidance for CINDI Program. Prevalence and intensity of analyzed risk factors of cardiovascular diseases were assessed according to WHO recommendations (4, 5). Hypertension was defined as blood pressure $\geq 140/90$ mmHg (or lower during hypotensive treatment); hypercholesterolaemia was diagnosed when plasma total cholesterol concentration was $\geq 5,2$ mmol/l (or lower in patients treated with lipid-lowering medications). Obesity was assessed by body mass index criteria (BMI ≥ 30 kg/m^2). Physical activity level was classified as unsatisfactory if aerobic exercises were performed less than 30 minutes three times per week.

QUALITY OF LIFE ASSESSMENT

Quality of life was assessed by means of Polish version of international, generic measure – the EuroQol EQ-5D questionnaire. It defines health in terms of five dimensions: mobility, self care, usual activities (work, study, housework, family or leisure), pain or discomfort, and anxiety or depression. Each dimension is subdivided into three categories, which indicate whether the respondent has no problem, a moderate problem, or an extreme problem (see below). The EQ-5D questionnaire comprises two pages; on the first page respondents record the extent of their problem in each of the five dimensions and on the second page they record their perception of their overall health on a visual analogue scale (VAS) (0 denoting the worst imaginable health state and 100 denoting the best imaginable health state). The validity and reliability of the EQ-5D questionnaire as well as its application in a range of patient groups were precisely tested (6, 7). The EQ-5D questionnaire has been fielded in population surveys in many countries, for example in United Kingdom, Germany, the United States or Canada (8, 9). In Poland this questionnaire has been already used in the assessment of quality of life of individuals at risk of coronary artery disease and in the elderly (10, 11).

Analysis mainly compared the differences between population subgroups. χ^2 test was used for the analysis of the descriptive data, and Student's t test was used to investigate subgroup differences in the visual analogue scale data. Analysis of variance was used in order to test the collective influence of background variables. Differences were considered statistically significant at $p<0.05$.

Your own health state today

By placing a tick in one box in each group below, please indicate which statement best describes your own health state today.

Do not tick more than one box in each group.

Mobility

I have no problems in walking around ☐

I have some problems in walking around ☐

I am confined to bed ☐

Self-care

I have no problems with self-care ☐

I have some problems in washing and dressing myself ☐

I am unable to wash and dress myself ☐

Usual activities (eg. work, study, housework, family or leisure activities)

I have no problems with performing my usual activities ☐

I have some problems with performing my usual activities ☐

I am unable to perform my usual activities ☐

Pain/discomfort

I have no pain or discomfort ☐

I have moderate pain or discomfort ☐

I have extreme pain or discomfort ☐

Anxiety/depression

I am not anxious or depressed ☐

I am moderately anxious or depressed ☐

I am extremely anxious or depressed ☐

Your own health state today

To help people say how good or bad a health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0.

We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box below to which ever point on this scale indicating how you perceive your own health.

Best imaginable health state

100

9 0

8 0

7 0

6 0

Your own health state today

5 0

4 0

3 0

2 0

1 0

0

Worst imaginable health state

RESULTS

Quality of Life and Sociodemographic Features
The general assessment of the participants' quality of life is demonstrated in Tables 1 and 2. A moderate problem (answer b in the questionnaire) was most often reported in the pain or discomfort dimension (by 57.1% of respondents). Extreme problems (answer c in the questionnaire) were rarely declared for mobility, self-care, usual activities and pain/discomfort (by 0.4%, 0.3%, 0.5%, 2.2% of respondents respectively), however more than 9% of women and 6% of men reported experiencing constant and unbearable state of depression (Table 1).

The mean state of subjective health recorded on the visual analogue scale was 74.6 ± 16. The mean value decreased from 82.3 in the youngest age group to 65.9 in the oldest age group. The differences were significant between each of the studied age groups ($p < 0.0001$) (Fig. I). The rates of reported problems increased significantly with age for all dimensions except for anxiety/depression, which was quite similar in all age groups (Table 2).

Women tended to assess their health state worser than did men and reported significantly higher rates of problems ($p < 0.01$) except for self care which was more often problematic for men (Table 1).

Respondents who were widowed or divorced scored significantly lower on the visual analogue scale in comparison to those who were single or married (mean scores: 60, 66 and 83, 74, respectively). Important differences in subjective assessment of health state were also found according to participants' education and economic status. Those who received higher education as well as those who were employed or still studying recorded significantly higher scores on the VAS than respondents with elementary education (elementary vs university education $p < 0.005$), unemploy-

ed (unemployed vs employed $p < 0.00001$) and retired (retired vs employed $p < 0.01$). A similar pattern was noticed in the rates of problems within analyzed dimensions of quality of life, with significant differences for mobility (retired vs employed $p < 0.05$), pain/discomfort (elementary vs university education $p < 0.01$; retired vs employed $p < 0.001$), anxiety/depression (unemployed vs employed $p < 0.0001$, retired vs employed $p < 0.001$, elementary vs university education $p < 0.01$).

Quality of Life and Risk Factors of Cardiovascular Diseases
There were statistically significant differences in QL perception according to blood pressure (BP) and total cholesterol concen-
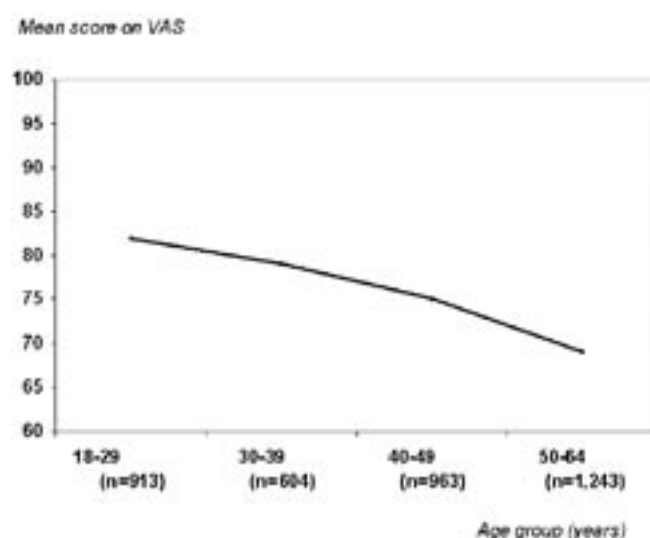

Fig. 1. Mean self rated health status of respondents on visual analogue scale (VAS), by age groups.

Table 1. Numbers (percentage) of persons reporting problems in each EuroQol dimension, by sex

EuroQol dimension	Problem					
	moderate		extreme		any	
	women	men	women	men	women	men
Mobility	285 (15.7)	248 (13.1)	5 (0.3)	9 (0.5)	300 (16.4)	258 (13.6)
Self-care	59 (3.3)	70 (3.7)	3 (0.2)	9 (0.5)	62 (3.4)	79 (4.1)
Usual activities	201 (11.1)	173 (9.1)	7 (0.4)	10 (0.6)	208 (11.4)	183 (9.6)
Pain/discomfort	1158 (63.9)	959 (50.6)	43 (2.4)	37 (2.0)	1201 (65.9)	996 (52.4)
Anxiety/depression	739 (40.9)	656 (34.8)	169 (9.4)	119 (6.3)	908 (49.8)	775 (40.8)

Table 2 Percentage of persons reporting problems, by age group

EuroQol dimension	Age group			
	18-29 years n=913	30-39 years n=604	40-49 years n=963	50-64 years n=1243
Mobility	3.3	5.8	13.4	28.7
Self-care	0.5	2.2	3	7.5
Usual activities	4.2	4.5	9.9	18.7
Pain/discomfort	44.7	49.7	65.7	69.8
Anxiety/depression	45.3	47.2	49.7	48.1

tration (TC) (Table 3). Hypertension was found in 1,822 (48.9%) individuals: 820 women and 1002 men. The mean value on VAS tended to decrease with the increase of patients' blood pressure level (Fig. 2). Generally the higher BP the higher percentage of patients declaring problems in the analyzed dimensions of quality of life (Table 3). There were not significant differences noted in QL assessment between healthy individuals and patients with successfully treated hypertension (i.e. <140/90 mmHg) (p>0.05).

Hypercholesterolaemia was found in 2,330 persons (62.6%), 1,029 women and 1,301 men. Rates of reported problems were higher in the group of respondents with TC ≥ 5.2 mmol/l than in group with normal cholesterol concentration; the largest differences were found in mobility (p<0.0001), self care (p<0.001) and usual activities (p<0.002) (Table 3). Figure 3 shows that mean scores on the visual analogue scale are significantly higher for

those with TC < 5,2 mmol/l than for patients with hypercholesterolaemia (p<0.0001).

A total of 1,321 participants of the study (35.5%), 375 women and 946 men were regular smokers. Persons who smoked reported higher rates of problems than non-smokers, but the differences were not statistically significant (Table 3). Mean scores on the visual analogue scale were similar in the group of regular smokers and non-smokers (74.4 and 74.8 respectively).

Percentage of persons reporting problems in the analyzed dimensions according to physical activity level is demonstrated on Fig. 4. Sedentary lifestyle was declared by 2,531 persons (68%), 1,384 women and 1,147 men. They recorded significantly lower scores on the visual analogue scale than people with satisfactory level of physical activity (73.6 and 76.9 respectively, p<0.00001) and reported higher rates of problems on all five dimensions
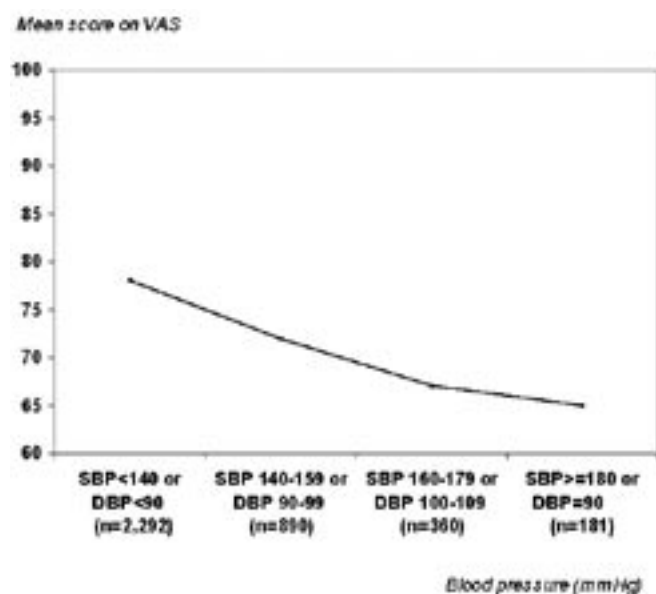

Fig. 2. *Mean self rated health status of respondents on visual analogue scale (VAS), by blood pressure level. SBP - systolic blood pressure, DBP - diastolic blood pressure.*
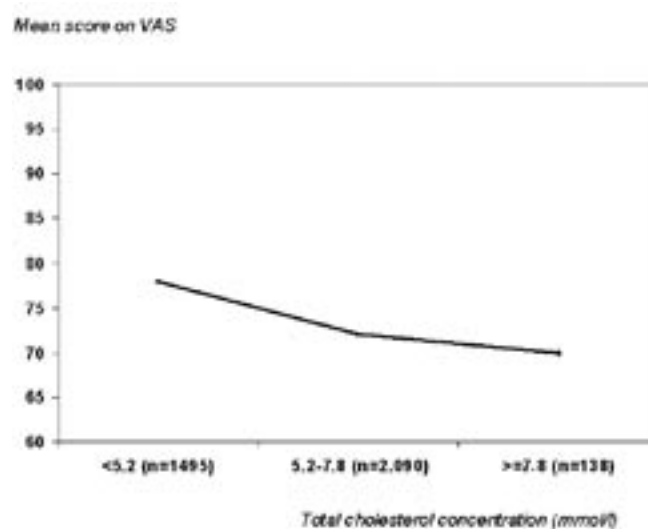

Fig. 3. *Mean self rated health status of respondents on visual analogue scale (VAS), by total cholesterol concentration.*

Table 3. *Percentages of persons reporting any problem, by blood pressure level, total cholesterol concentration and smoking status*

Risk factors		EuroQol dimension				
		Mobility	Self-care	Usual activities	Pain/discomfort	Anxiety/depression
Blood pressure (mmHg)						
<140/90	n=2,292	10.9	2.6	8.0	57.5	45.0
140-159/90-99	n=890	17.5	4.9	14.2	60.0	45.8
160-179/100-109	n=360	25.6	5.9	15.3	65.3	45.3
≥ 180/110	n=181	26.0	9.9	15.5	68.5	44.7
Total cholesterol (mmol/l)						
<5.2	n=1,495	10.2	2.3	7.4	54.9	45.8
5.2-7.8	n=2,090	17.6	4.7	12.3	61.9	42.0
≥7.8	n=138	19.7	5.8	15.9	60.0	43.6
Smoking status						
Smokers	n=1,321	14.8	3.8	10.9	58.7	44.8
Non-smokers	n=2,402	14.6	3.8	11.0	59.4	45.4

with statistically significant differences for mobility (p<0.02), pain/discomfort (p<0.0001) and anxiety/depression (p<0.005). When participants were grouped according to body mass index, the mean scores on the VAS of overweighed and obese persons were significantly lower than for people with BMI < 25 kg/m² (Fig. 5).

Analysis of variance was used to investigate the collective influence of background variables. With the score on the visual analogue scale as the dependent variable and age as a covariate, a significant contribution was found for sex (p<0.001), education (p<0.001), blood pressure (p<0.05) and physical activity level (p<0.003).

DISCUSSION

This study provides the first insight into the health related quality of life parameters of Polish urban population. The analysis of five
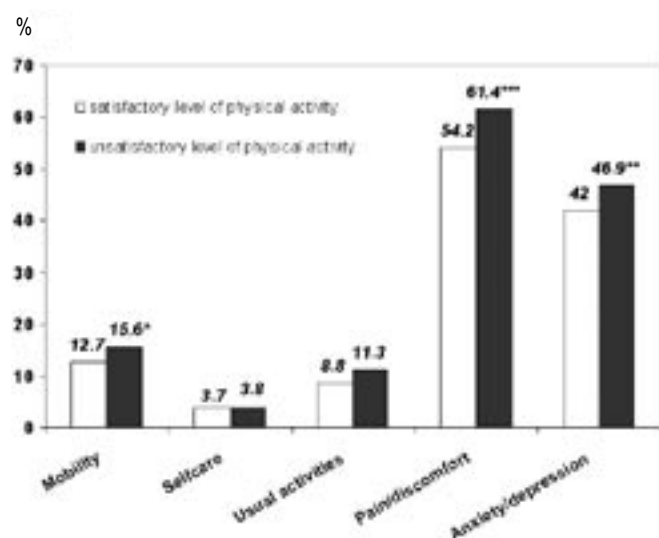
Fig. 4. Percentages of persons reporting problems, by physical activity level.
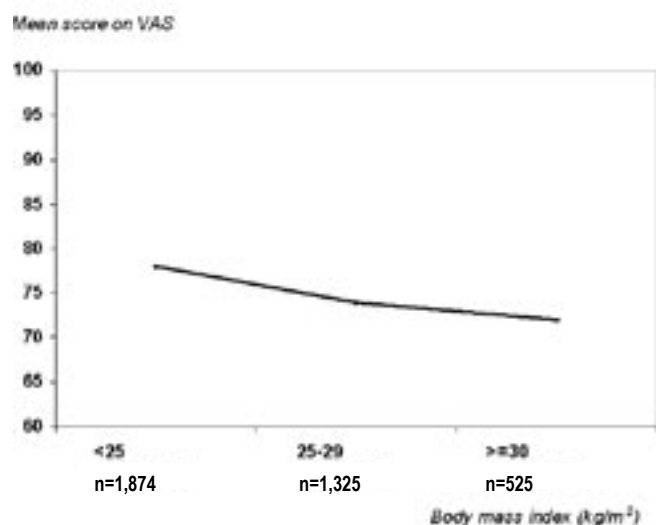** p<0.05, **p<0.005, ***p<0.001*

Fig. 5. Mean self rated health status of respondents on visual analogue scale (VAS), by body mass index.

QL dimensions revealed a very high level of reported problems, especially in the area of pain and mood disorders. There is good evidence that pain has a powerful influence on society's valuations of states of health (12). In this survey over 66% of women and 52% of men declared experiencing pain or discomfort and the prevalence of pain was relatively high even in the youngest age group. Although anxiety and depression were less frequently reported than pain or discomfort, there was a striking high level of extreme problems in this dimension – 9.4% of women and 6.3% of men declared suffering from stable or unbearable mood disorders. This finding has important implications. Being so widely experienced in the urban community, pain and mood disorders should be dimensions of special interest in national disability surveys as well as prevention and treatment intervention programs.

Also the mean score recorded on the visual analogue scale was relatively low (74.6), especially when compared with results obtained from population-based surveys in other countries (13). In the United Kingdom national questionnaire survey the mean score assessed by the same questionnaire was 82.5 (9). Also in the Stockholm County public health survey the mean scores ranged from about 90 in the youngest age group (20-29 years) to about 69 in the oldest age group (80-88 years)(14). In our study the oldest persons were 64 years old, so we can predict the results to be even much worse after inclusion people aged 65 and more.

Significant differences in quality of life parameters were found between population subgroups according to such sociodemographic variables as age, sex, marital status, education and employment. These results are consistent with findings reported by other authors (8, 15, 16).

In the present report we also demonstrated the impact of major risk factors for cardiovascular diseases on health related quality of life. Among all analyzed factors, hypertension seems to have the best documented role in modifying QL (17, 18, 19). Similar to other authors' findings, our data show that hypertension adversely affects elementary parameters of QL even after adjustment for age. To some extent, we also demonstrated the benefits of efficient management of hypertension. Disability rates and the mean scores on the VAS were similar for normotensive persons and hypertensive patients with blood pressure <140/90 mmHg. The results obtained within the hypertensive population were influenced by the level of blood pressure. Patients with BP ≥180/110 mmHg reported more problems in all studied dimensions than persons with the 1. stage of hypertension, and statistically significant differences were found for mobility, self care and pain.

The results demonstrated a beneficial effect of at least moderate physical activity on overall functioning, especially in the aspect of mobility, perception of pain and mood disorders. Quality of life of persons with sedentary lifestyle was significantly poorer in all studied age groups. It is consistent with our previous studies that revealed a significant impact of physical activity on QL regardless the age and objective health state (10). Also overweight and obesity, directly connected with physical activity level, significantly deteriorated overall well-being. According to other studies weight reduction with dietary therapy and exercise training can also result in important improvement in behavioral characteristics and quality of life parameters, especially vitality, physical and social functioning and perception of pain (20, 21).

Total blood cholesterol has not been a subject of detailed analysis in the context of influencing quality of life. However, a few

studies demonstrated that lower TC correlated with serious mood disorders, depression and even suicides or sudden deaths (22, 23). Other authors did not confirm such link and several recent randomized multi-center trials provided firm evidence that lowering blood cholesterol below 5,2 mmol/l results in important benefits for health and significant reduction in total mortality (also due to accidents, suicides and sudden deaths) (24, 25). In this study no significant differences were noted in the prevalence of mood disorders between persons with correct lipid profile and patients with hypercholesterolemia. However, elevated total cholesterol correlated with higher rates of problems with pain, mobility and performing usual activities, and significantly lower scores assessing subjective state of health.

This survey did not demonstrate differences in QL according to smoking status. Although most of other authors provided important evidences of unfavorable influence of smoking cigarettes on QL (26, 27), we did not observe such link. The probable explanation of it can be a significantly higher percentage of people with satisfactory physical activity level (p<0.001) and significantly lower percentage of patients with hypertension (p<0.01) in the group of smokers than in non-smokers.

Several study limitations need to be emphasized. Firstly, the results obtained in this study refer only to young and middle-aged adults as we did not include persons over 65. However, subjective health state and quality of life of the elderly in Polish urban population has already been a subject of the detailed analysis (11). It should be also borne in mind that this survey was likely to exclude individuals who had severe problems with mobility or self care and therefore were not able to come and take part in the study. Thus, the results may well underestimate the health related quality of life of the general population. Secondly, we were not able to investigate possible mechanisms of shown relationships between the presence and intensity of hypertension, hypercholesterolaemia, sedentary lifestyle and QL scores. Due to the current recommendations quality of life of patients with any diagnosed disorder should be assessed by means of a questionnaire specific to an analyzed disease (8). The participants of this survey represented different health status, so we could use only a general questionnaire, originally designed to measure QL in general populations. Finally, the response rate in this study (about 55%) is not satisfactory. Low participation rate concerns mostly young adults aged 18-34 years. We presume that the young do not take care of their health state as much as the older and probably have less time to participate in medical investigations. Therefore, further analysis of quality of life is needed in the population of young adults.

Despite the above limitations, these data indicate that quality of life of studied population has a close relationship with some preventable factors. The results support the need for implementing effective interventions in the society, especially in the area of prevention and management of hypertension and sedentary lifestyle. In order to improve quality of life parameters, pain and mood disorders (anxiety/depression) should be a subject of special interest in further national surveys and intervention programs.

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