

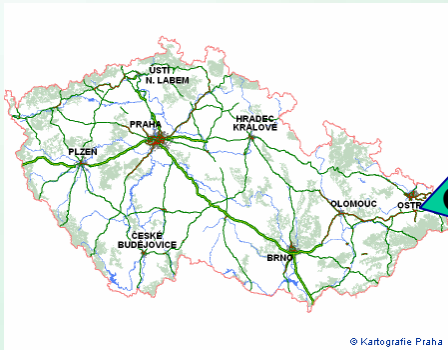
LIFE-STYLE AND SOCIO-ECONOMIC STATUS

RELIABILITY OF QUESTIONNAIRE SURVEY

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Introduction

The study of reliability was a part of the project funded by the Czech Ministry of Health – “Subjective approach of inhabitants of Ostrava to their health in association with their life-style, socio-economic status and education”.

The study is based on the questionnaire survey.

Ostrava is a large industrial city in the Northern Moravia with about 300.000 inhabitants. A random sample of population aged from 25 to 70 years was used for the study. The sample consists of 3.000 respondents.

A structured questionnaire was distributed and collected by postal delivery. The response rate was 21.1 % (634 questionnaires).

Verification of data

The valid measurement measures what we really intended to measure (pilot study)

The reliable measurement is a measurement which gives us the same results with the repeated application, supposing the state of the examined subject did not change (repeatability study)



Repeatability study

- ✚ took place 6 weeks after the main questionnaire study
- ✚ 300 respondents were chosen from a total of 634 who returned the completed questionnaire in the main study
- ✚ the total number of returned and completed questionnaires was 181 (60.3% of the response rate)

Methods

- ✚ whole percentages of agreement
- ✚ Kappa index



Values and interpretations of the Kappa index

The calculation of the Kappa index was firstly suggested by Cohen. Its further modification was the purpose of a study by Landis and Koch, and Fleiss. Calculation of the Kappa value is based on the total ratio of agreement (p_0) and an expected ratio of agreement (p_e).

$$\text{Kappa index } k = (p_0 - p_e) / (1 - p_e)$$

Values of the Kappa index	Interpretation of agreement
1 – 0.81	Almost perfect
0.8 – 0.61	Good
0.6 – 0.41	Average
0.4 and less	Weak

Results and discussion

Evaluation: 61 questions and sub-questions
 180 questionnaires

Sections of questionnaire:

- + A. General questions**
- + B. Employment**
- + C. Life-style**
- + D. Health**
- + E. Personality**



Section A. General questions

Question	Percentage of answers	Agreement of answers in %	Kappa Index	Interpretation of agreement
Sex *	100.0	100.0	1.00	Almost Perfect
Marital status *	99.4	99.4	0.99	
Social position *	99.4	93.9	0.91	
Education *	99.4	91.6	0.89	
Economic situation *	98.3	84.8	0.63	Good
Trend of economic situation	97.2	70.9	0.53	
Net annual income *	97.2	72.0	0.52	
Satisfaction with economic s.	97.2	71.4	0.51	
Arithmetic mean	98.5	85.5	0.75	

Section B. Employment

Question	Percentage of answers	Agreement of answers in %	Kappa Index	Interpretation of agreement
Registration at the Labour Office *	87.2	100.0	1.00	Almost Perfect
Second occupation *	73.3	93.2	0.80	
Characteristics of present job *	57.8	86.5	0.75	Good
Influence of work on health	60.0	46.3	0.35	Weak
Arithmetic mean	69.6	81.5	0.72	

Section C. Life-style

Question	Percentage of answers	Agreement of answers in %	Kappa Index	Interpretation of agreement
Smoking *	96.1	93.6	0.91	Almost Perfect
Regular eating *	90.6	93.3	0.84	
Health problems *	36.7	90.9	0.82	
Coffee drinking *	98.9	83.7	0.75	Good
Place of spending holiday *	85.0	83.7	0.75	
Drinking alcoholic beverages *	96.7	89.7	0.74	
Regular physical activity, sport, hiking *	82.8	87.3	0.73	
Sufficient sleep	93.3	88.1	0.69	
Drinking strong tea *	92.2	88.6	0.68	
Housekeeping *	97.8	79.6	0.66	
Weekends spent outside Ostrava *	92.8	71.3	0.64	
Negative health impact of drinking strong tea	91.1	75.0	0.61	
Serious problems *	86.7	80.1	0.60	
Financial problems *	36.7	78.8	0.58	
Length of holiday *	77.2	69.8	0.57	
Negative health impact of coffee drinking	95.6	73.8	0.56	
Family problems *	36.7	78.8	0.56	
Problems at work *	36.7	78.8	0.51	
Housing problems *	36.7	86.4	0.49	
Feeling relaxed after holiday	83.3	76.7	0.47	
Eating according healthy nutrition	98.9	59.0	0.44	
Nourishment situation	97.8	60.2	0.43	
Negative health impact of smoking	92.2	95.8	-0.01	Weak
Arithmetic mean	79.7	81.0	0.61	

Section D. Health

Question	Percentage of answers	Agreement of answers in %	Kappa Index	Interpretation of agreement
Reason for keeping weight limit *	53.9	94.9	0.90	Almost Perfect
Preventive examination – gynaecologist *	42.8	93.5	0.82	
Preventive examination – dentist *	66.1	91.6	0.76	Good
Preventive examination – general phys. *	65.0	88.0	0.76	
Chronic disease *	95.0	87.7	0.74	
Preventive examination – occupational physician *	33.9	86.9	0.73	
Keeping weight limit *	93.3	86.3	0.70	
Taking sickness benefits *	67.2	81.0	0.69	
Vegetarian *	98.3	99.4	0.66	
Information about nourishment *	95.6	87.8	0.66	
Low-calorie diet *	97.2	85.7	0.65	
Reason for sickness benefits refusal *	28.9	75.0	0.63	
Health status	96.7	73.6	0.60	Average
Following information about improving health *	96.1	87.3	0.56	
Reduction of food intake	97.2	87.4	0.50	
Physical condition – evaluation	97.8	69.3	0.50	
Teridness, irritability	95.6	57.6	0.45	
Level of health care	96.7	69.5	0.36	Weak
Arithmetic mean	78.7	83.5	0.65	

Section E. Personality

Question	Percentage of answers	Agreement of answers in %	Kappa index	Interpretation of agreement
Political orientation *	97.2	83.4	0.77	Good
Religion *	95.6	87.8	0.74	
Contacts with friends *	97.8	86.4	0.71	
Test – inclination to stress	88.3	52.1	0.61	
Problems relating to interpersonal relations	96.7	85.1	0.55	Average
Possibility of influencing satisfactory life	93.3	80.4	0.54	
Test – sensitivity to stress	83.3	65.3	0.48	
Contentment in life	96.1	72.3	0.38	Weak
Arithmetic mean	93.5	76.6	0.60	

Evaluation of the number of the questions according to the Kappa index

Value of Kappa index	Interpretation of agreement	Number of questions	Percentages of questions
1 – 0.81	Almost perfect	10	16.4
0.8 – 0.61	Good	28	45.9
0.6 – 0.41	Average	19	31.1
below 0.4	Weak	4	6.6
Total		61	100

Evaluation of questions according to their characters

Indicator	Group	Number of questions	Arithmetic mean	95% CI		Evaluation of t-test
percentage of agreement	factual	40	86.8	84.4	89.3	p<0.001
	evaluative	21	72.1	66.4	77.8	
Kappa index	factual	40	0.73	0.69	0.77	p<0.001
	evaluative	21	0.48	0.42	0.55	

How the questions with low Kappa values were solved?

Question	Original values		Solution	New values	
	Kappa index	Agreement of answers in %		Kappa index	Agreement of answers in %
Net annual income	0.52	72.0	the substitution by the question „Evaluation of economic situation“	0.63	84.8
Influence of work on health	0.35	46.3	the kappa index with weights was calculated this question was not used for the analysis	0.47	64.4
Negative health impact of smoking	-0.01	95.8	we diagnosed as the mistake of filling in question	-	-
Eating according healthy nutrition	0.44	59.0	the aggregation of the answers but this question was not used for the analysis	0.58	77.0
Nourishment situation	0.43	60.0	the aggregation of the answers	0.62	82.4
Level of health care	0.36	69.5	the aggregation of the answers this question was not used for the analysis	0.34	86.0
Tiredness, irritability	0.45	57.6	the aggregation of the answers	0.66	83.1
Contentment in life	0.38	72.3	the aggregation of the answers	0.48	80.5

Conclusion

- ✚ The factual questions attained significantly higher values of the Kappa index than the questions which comprised an evaluative or motivating element, where possibly the respondents' opinion could have been influenced by their present circumstances (present mood, health, and the like).
- ✚ The questions where the agreement of answers was evaluated as average or even weak three types of solution were used: a) substitution by the analogous questions with a higher agreement, b) aggregation of the answers if possible, or c) the questions were not used for the analyses.
- ✚ The results of the repeatability studies are a valuable source of information, which should be used for further data analyses and interpretation of the results of epidemiological questionnaire surveys.

