

SUBJECTIVE WELLBEING OF CYCLISTS AND PHYSICALLY INACTIVE SUBJECTS

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Abstract:

The aim of this study was to compare the self-perceived quality of life between inactive people and people who cycle regularly and thus explore the relation between this type of physical activity and personal wellbeing. The study included 108 persons who used a bicycle three or more times a week for longer than half an hour per day, as a means of transport or recreation, and 100 persons, as a control group, who were physically active less than three times a week or took up no activity at all. The cyclists showed a higher quality of life than the controls in the overall personal wellbeing index (PWI) as well as in the domain of "health". Another statistically important difference was observed between the groups in changes in health, where 16.7% of cyclists claimed to be of much better health than a year ago, as did only 2% of inactive respondents. A difference was also observed in the segment of health deterioration relative to a year ago where 30% of inactive participants reported their health worsened as compared to a year ago, as did only 8% of cyclists. While 4% of inactive respondents felt their health deteriorated drastically, no cyclist thought likewise. Our results suggest that cycling may be a mode of physical activity that is positively related to life satisfaction.

Key words: cycling, physical activity, quality of life, Croatia

Introduction

The definition of quality of life is still a subject of debate among researchers. We consider quality of life as the ability to enjoy normal life activities (Ferrans & Powers, 1992). Cummins (2003) suggested that the new understanding is that 'quality of life' is a dual construct, comprising both the familiar objective dimension and another subjective dimension that is more challenging to measure and understand. Quality of life is often associated with happiness and subjective wellbeing (Cummins, 2000a). According to the American Heart Association (2011) and the Centers for Disease Control and Prevention (2011), physical activity is a factor that can improve the quality of life. Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure (WHO, 2011a; Caspersen, Powell, & Christenson, 1985). The results from the World Health Survey, carried out during 2002–2003 in 51 countries worldwide, with a short version of the *International Physical Activity Questionnaire* (IPAQ) used for assessment, showed the overall prevalence of physical inactivity of 18%

(Guthold, Ono, Strong, Chatterji, & Morabia, 2008). Physical inactivity is increasing in many countries and is associated with 3.2 million deaths globally, with 670,000 premature deaths occurring in people younger than 60 years of age and is accountable for about 30% of cases of diabetes and ischemic heart disease (WHO, 2011b). The estimation of being a cause to 6% of cases of death worldwide makes physical inactivity the fourth leading risk factor for global mortality (WHO, 2011b). These data indicate the importance of regular physical activity for health and quality of life of the population. Daily activity should be accepted as the cornerstone of a healthy lifestyle. Physical activity should be reintegrated into the routine of everyday living. An obvious first step would be the use of stairs instead of lifts, and walking and cycling for short journeys (WHO, 1995). Compared with walking, the health benefits of cycling are somewhat greater because the intensity of effort is greater (Oja, Vuori, & Paronen, 1998). Thematic Guidelines from 2010, designed for the European Mobility Week by the Croatian Ministry of Environmental Protection,

Physical Planning and Construction, argue that riding a bicycle as a means of transport ensures regular activity, which can be easily, and with minimum expense, integrated into the daily routine (Croatian Ministry of Environmental Protection, Physical Planning and Construction, 2010), thus saving time – the modern man’s asset – by doing exercise while commuting. Cycling is a good option for people of different ages and physical conditions, without a major risk of injury or health threats.

A systematic review showed that a few studies found a positive association between Health-Related Quality of Life (HRQoL) and physical activity (Bize, Johnson, & Plotnikoff, 2007). Higher levels of physical activity are associated with better HRQoL (Anokye, Trueman, Green, Pavey, & Taylor, 2012). However, evidence on the association between HRQoL and physical activity in the general population is limited as research to date has focused on specific interventions or populations with chronic conditions (Bize, et al., 2007).

The aim of this study was to compare the self-perceived quality of life between inactive people and people who cycle three and more times a week and thus explore the relation between this type of physical activity on personal wellbeing.

Methods

Participants

The study included 208 persons in total, divided into two groups – cyclists and inactive people. The group of cyclists was gathered in cooperation with “Biker”, a Croatian cycling magazine, and members of the “Green Action”, a civic organization that advocates the improvement of ecology. The control group of inactive people was gathered in cooperation with the cycling clubs and family medical doctors in the municipalities of residence where we conducted the research on the cyclists. People with health issues and impairments were not included in the study because family medical doctors did not invite them to participate in the study. The group of cyclists included 108 persons who ride a bicycle three or more times a week, for longer than half an hour, as a means of transport or recreation. The control group consisted of 100 persons, who were physically active less than three times a week or took up no activity at all. The study excluded professional cyclists.

In the group of cyclists sixty-six respondents were men (61%), average age 35.33 (± 10.46) years, and 42 women (39%), average age 36.29 (± 9.90) years. Among the control respondents, 58 were men (58%), average age 37.50 (± 9.35) years, and 42 women (42%), average age 36.43 (± 10.06) years. The following matching criteria were applied in the selection of the control group: sex and age (± 5

years), residence, and education. Each respondent had an identical control respondent complying with the above parameters. Most respondents in both groups had higher education (62%), and 37% had a high-school diploma. The remaining 1% had completed elementary education from age 7 to 14 only. Considering the selective pattern of the control group, no significant differences were observed among groups in terms of age or level of education.

Measures

In this study, a multidimensional approach was used to measure the quality of life (Cummins, 2000b). Subjective quality of life was assessed using the Personal Wellbeing Index (PWI; International Wellbeing Group, 2006). The PWI scale contains seven items of satisfaction, each one corresponding to a quality of a life domain: standard of living, health, achievements in life, close relationships, personal safety, community connectedness, and future security. These seven domains theoretically represent the first level deconstruction of the global question: “How satisfied are you with your life as a whole?” The overall PWI score is an aggregate average score across the seven domains. Each domain is rated on a bipolar 11-point (0–10) end-defined scale where 0 means ‘completely dissatisfied’ and 10 ‘completely satisfied’. PWI has satisfactory metric characteristics; Cronbach alpha lies between .70 and .85. Inter-domain correlations are often moderate at around .30 to .55, and item-total correlations are at least .50. PWI has also shown good test–retest reliability across 1–2 week intervals, with an intra-class correlation coefficient of .84 (International Wellbeing Group, 2006). In this study, we also used a question which is a part of SF 36 (Ware, Kosinski, & Gandek, 2000), a World Health Organization’s questionnaire for measuring self-perceived health, which refers to changes in health relative to one year ago (five levels from ‘how much the condition is better than a year ago’ to ‘how much the condition is worse than a year ago’). The participants also completed a general questionnaire containing some demographic data (sex, age, place of residence, and educational background). The cycling and physical activity behaviors were assessed by the interview, in which participants were asked if they ride a bicycle three or more times a week, for longer than half an hour, and if not, is it because of some physical limitation.

Data analysis

Differences between the groups were analyzed by *t*-test, while category data distributions were tested by χ^2 test. STATISTICA, ver. 7.1, program was used for the analysis (StatSoft, Inc., Tulsa, OK, USA). The level of statistical significance was set at $p < .05$.

Results

The group of cyclists showed a higher quality of life than the control group of inactive persons in the overall index (PWI) as well as in the domain "health" (Table 1). Another statistically important difference was observed between the groups in changes in health, where 16.7% of cyclists claimed to be of much better health than a year ago, as did only 2% of inactive respondents. A difference was also observed in the segment of health deterioration

relative to a year ago where 30% of inactive participants reported their health worsened as compared to a year ago, as did 8% of cyclists. While 4% of inactive respondents felt their health deteriorated drastically, no cyclist thought likewise (Table 2). Since the inclusion criterion for the controls and for the study in general was a good general health, no participant had health disturbances that might have influenced the results (in terms of representing a differentiating factor between the two groups).

Table 1. Mean values and standard deviations (% SM) (scale maximum) for the seven domains of quality of life and the overall index (PWI) (Personal Wellbeing Index) to test the statistical significance of differences between cyclists and inactive persons

Domains	Activity	N	Mean	SD	t-test	p
Material wellbeing	cyclists	108	8.08	9.077		
	inactive	100	6.39	2.242	1.815	.071
Health	cyclists	108	8.26	1.417		
	inactive	100	6.84	2.369	5.193	<.001
Achieving in life	cyclists	108	8.34	9.000		
	inactive	100	6.71	1.966	1.775	.077
Personal relationships	cyclists	108	8.18	1.818		
	inactive	100	8.24	1.646	- 0.266	.791
Personal safety	cyclists	108	7.09	2.219		
	inactive	100	6.67	2.357	1.332	.184
Community-connectedness	cyclists	108	7.30	2.431		
	inactive	100	7.46	1.997	- 0.528	.598
Future security	cyclists	108	7.08	9.340		
	inactive	100	5.54	2.548	1.598	.112
PWI	cyclists	108	77.6190	32.78130		
	inactive	100	68.3571	16.97413	2.529	.012

Legend: N=number of participants; p=significance of the difference.

Table 2. Frequency distribution of answers to the unit 'changes in health in the last year' in cyclists and their physically inactive counterparts

Health relative to one year ago		Activity		
		Cyclists	Inactive	Total
Much better	N	18	2	20
	%	16.7%	2.0%	9.6%
Somewhat better	N	28	15	43
	%	25.9%	15.0%	20.7%
About the same	N	54	53	107
	%	50.0%	53.0%	51.4
Somewhat worse	N	8	26	34
	%	7.4%	26.0%	16.3
Much worse	N	0	4	4
	%	0%	4.0%	1.9
Total	N	108	100	208
	%	100.0%	100.0%	100

Chi-square=30.006; df=4; p<.001

Discussion and conclusions

The PWI total score for both groups was around 73.17±26.7% scale maximum (SM), which was above the average quality of life for the Croatian population (56.96±26.1% SM). However, the latter was measured with only one item on overall satisfaction with life, not as an average on seven domains (Vuletić, 2006). Nevertheless, according to PWI authors, the results can be compared (International Wellbeing Group, 2006). It should be noted that in the inactive group the PWI total score was significantly lower (68.36±17.0% SM) than in the physically active group (77.62±32.8% SM). The difference between the two groups was mostly at the expense of satisfaction with health. There appears to be a linear relation between physical activity and health status, so that a further increase in physical activity and fitness will lead to additional improvements in health status (Warburton, Nicol, & Bredin, 2006). Since it was emphasized in the procedure of recruiting the participants that people

with health issues were not to be included in the study, family medical doctors did not invite them to participate in the study, and they invited only healthy individuals, any possible initial inequalities between the physically active and control group were minimized. Due to this, the observed differences in satisfaction with health domain may be a result of chance or are related to some unassisted factors among cyclists and/or the controls. The statistically significant differences in life satisfaction between the groups is important, because they may and probably do reflect the real differences between the groups. Among the cyclists the better life satisfaction is probably related to self-selection to cycling. The partly and largely unmeasured baseline differences between the groups may further influence the outcomes of the study.

In 2001, a review concluded that physical activity, often in the form of endurance and/or resistance training exercise, was positively associated with HRQoL, regardless of age, health and activity status (Rejeski & Mihalko, 2001). For these reasons, we see a great opportunity in raising life satisfaction with physical activity which does not need to be expensive and time-consuming to be effective. Cycling for transport or as a leisure time activity demonstrates an ideal form of exercise, which can significantly increase the life satisfaction and sense of personal wellbeing.

In the segment of health deterioration relative to a year ago – 30% of inactive participants stated their health worsened as compared to a year ago, as did 8% of cyclists. In a study by Miilunpao, Vuori, Oja, Pasanen, and Urponen (1997), on a general population sample, 60% of respondents assessed their health the same as a year ago, with a very low percentage of significant change in the health status. These data speak in favor of the stability of self-perceived health in the studied populations, as does the present study, where 4% of inactive respondents claimed to have worse health than last year, but none of the interviewed cyclists did the same.

Life dissatisfaction is associated with mortality and adverse health behavior; thereby it could be used as a cumulative health risk indicator (Koiyumaa-Honkanen, et al., 2000). The current study

also demonstrated the cause of the association between physical activity and life satisfaction, but the association of these two variables could also be inverse, namely that physical activity has a positive impact on health and thereby increases life satisfaction.

A sedentary lifestyle is one of the causes that can lead to a poorer quality of life and to life dissatisfaction (Manson, Skerrett, Greenland, & Vantallie, 2004), and physical activity is a factor that can improve the quality of life (Centers for Disease Control and Prevention, 2011; American Heart Association, 2011). The importance of physical exercise is much better recognized as a key health and quality of life factor in the Scandinavian and Central European countries than in Croatia (Kinkela, Đonlić, & Moretti, 2008). Our results suggest that physical activity may be a factor positively related to life satisfaction.

The limitations of this study are the selection procedure for the respondents – who volunteered for the study instead of being selected randomly – and no verification whether the respondents' statements on cycling frequency were accurate or not. It could be that the cycling group performed even more physical activity in addition to their cycling behavior. However, this would not change the results in a different direction, they are still all in the physically active group. Except for the fact that people in the control group do not cycle, we were not able to assess the factors possibly causing the non-cycling among the controls which was also important to state in the limitations. Also, we cannot draw a conclusion that the cause of increased quality of life in the group of cyclists was physical activity because this is a cross-sectional study.

However, cycling, as a simple and inexpensive way of physical activity, can benefit health and thus the sense of general satisfaction with life. This result could be a valuable foundation for a new public health campaign promoting cycling, which would not require large investment funds and would bring benefits not only to health, but consequently be the one way of increasing personal wellbeing in the general population.

References

- American Heart Association. (2011). *Physical activity improves quality of life /on-line/*. Retrieved December 15, 2011 from: http://www.heart.org/HEARTORG/GettingHealthy/PhysicalActivity/StartWalking/Physical-activity-improves-quality-of-life_UCM_307977_Article.jsp
- Anokye, N.K., Trueman, P., Green, C., Pavey, T.G., & Taylor, R.S. (2012). Physical activity and health related quality of life. *BMC Public Health*, 12, 624.
- Bize, R., Johnson, J.A., & Plotnikoff, R.C. (2007). Physical activity level and health-related quality of life in the general adult population: A systematic review. *Preventive Medicine*, 45(6), 401–415.

- Caspersen, C.J., Powell, K.E., & Christenson, G.M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports*, 100(2), 126–131.
- Centers for Disease Control and Prevention. (2011). *Physical activity and health /on-line/*. Retrieved December 15, 2011 from: <http://www.cdc.gov/physicalactivity/everyone/health/index.html>
- Croatian Ministry of Environmental Protection, Physical Planning and Construction. (2010). *European mobility week /on-line/*. Retrieved December 15, 2011 from: http://www.mzoiop.hr/doc/ETK/Tematske_smjernice_2010.pdf
- Cummins, R.A. (2000a). Personal income and subjective well-being: A review. *Journal of Happiness Studies*, 1, 133–158.
- Cummins, R.A. (2000b). Objective and subjective quality of life: An interactive model. *Social Indicators Research*, 52, 55–72.
- Cummins, R.A. (2003). Normative life satisfaction: Measurement issues and a homeostatic model. *Social Indicators Research*, 64, 225–256.
- Ferrans, C.E., & Powers, M.J. (1992). Psychometric assessment of the quality of life index. *Research in Nursing & Health*, 15(1), 29–38.
- Guthold, R., Ono, T., Strong, K.L., Chatterji, S., & Morabia, A. (2008). Worldwide variability in physical inactivity a 51-country survey. *American Journal of Preventive Medicine*, 34, 486–494.
- International Wellbeing Group. (2006). *Personal wellbeing index*. Australian Centre on Quality of Life, Deakin University, Melbourne. Retrieved December 15, 2011 from: http://www.deakin.edu.au/research/acqol/instruments/wellbeing_index.htm
- Kinkela, D., Donlić, V., & Moretti, V. (2008). Cjeloživotno tjelesno vježbanje za održivi razvoj. [Lifelong physical training for sustainable development. In Croatian.] In V. Uzelac & L. Vujičić (Eds.), *Cjeloživotno učenje za održivi razvoj* (p. 281). Sveučilište u Rijeci: Učiteljski fakultet u Rijeci.
- Koivumaa-Honkanen, H., Honkanen R., Viinamaki, H., Heikkila, K., Kaprio, J., & Konskenvuo, M. (2000). Self-reported life satisfaction and 20-year mortality in healthy Finnish adults. *American Journal of Epidemiology*, 152(10), 983–991.
- Manson, J.E., Skerrett, P.J., Greenland, P., & VanItallie, T.B. (2004). The escalating pandemics of obesity and sedentary lifestyle: A call to action for clinicians. *Archives of Internal Medicine*, 164(3), 249–258.
- Miilunpalo, S., Vuori, I., Oja, P., Pasanen, M., & Urponen, H. (1997). Self-rated health status as a health measure: The predictive value of self-reported health status on the use of physician services and on mortality in the working-age population. *Journal of Clinical Epidemiology*, 50(5), 517–528.
- Oja, P., Vuori, I., & Paronen, O. (1998). Daily walking and cycling to work: Their utility as health-enhancing physical activity. *Patient Education and Counseling*, 33(1), 87–94.
- Rejeski, W.J., & Mihalko, S.L. (2001). Physical activity and quality of life in older adults. *Journal of Gerontology: Biological Sciences, Medical Sciences*, 56, 23–35.
- Vuletić, G. (2006). Health related quality of life and satisfaction with life in Croatia. In Y. MacKay (Ed.) *Proceedings of the 8th Australian Conference on Quality of Life*. Deakin University, Melbourne, Australia, 29-30 November, 2006. Retrieved February 28, 2013 from: <http://www.deakin.edu.au/research/acqol/conferences/abstracts-papers/2006/index.php>
- Ware, J.E., Kosinski, M., & Gandek, B. (2000). SF-36® Health Survey: Manual and interpretation guide. Lincoln, RI: Quality Metric.
- Warburton, D.E.R., Nicol, C.W., & Bredin, A.S.D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174(6), 801.
- WHO/FIMS Committee on Physical Activity for Health. (1995). Exercise for health. *Bulletin of the World Health Organization*, 73(2), 135–136.
- World Health Organization. (2011a). *Physical activity /on-line/*. Retrieved February 23, 2011 from: http://www.who.int/topics/physical_activity/en/
- World Health Organization. (2011b). *Global recommendations on physical activity for health /on-line/*. Retrieved February 23, 2011 from: http://www.who.int/mediacentre/news/notes/2011/world_cancer_day_20110204/en/

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SUBJEKTIVNI OSJEĆAJ DOBROBITI BICIKLISTA I TJELESNO NEAKTIVNIH OSOBA

Cilj je ove studije bio komparirati samoprocijenjenu kvalitetu života između neaktivnih osoba i osoba koje voze bicikl tri i više puta tjedno te na taj način utvrditi povezanost između ovog tipa tjelesne aktivnosti i osobne dobrobiti i kvalitete života. U istraživanje je bilo uključeno 108 osoba koje su se koristile biciklom tri ili više puta tjedno dulje od pola sata dnevno radi transporta ili rekreacije te 100 osoba, u okviru kontrolne grupe, koje su manje tjelesno aktivne od tri puta tjedno ili nisu uopće tjelesno aktivne. Grupa biciklista pokazala je višu kvalitetu života od kontrolne grupe neaktivnih osoba u ukupnom osobnom indeksu dobrobiti (PWI) kao i u domeni „zdravlje“. Statistički značajna razlika između grupa zabilježena je i u promje-

ni zdravlja budući da je 16,7% biciklista izjavilo da im je zdravlje puno bolje nego prije godinu dana, dok je isto izjavilo samo 2% neaktivnih ispitanika. Razlika je uočena i u pogoršanju zdravlja u odnosu na godinu dana prije jer je 30% neaktivnih ispitanika izjavilo da im se zdravlje pogoršalo, dok je isto primijetilo samo 8% biciklista. Nitko u skupini biciklista nije smatrao da im se zdravlje drastično pogoršalo, dok je 4% neaktivnih ispitanika smatralo tu tvrdnju točnom. Rezultati sugeriraju da bi vožnja biciklom mogla biti sadržaj tjelesne aktivnosti koji ima pozitivnu korelaciju sa zadovoljstvom životom.

Ključne riječi: *bicikliranje, tjelesna aktivnost, kvaliteta života, Hrvatska*