บทความวิจัย (Research Article)

Promoting safety bicycling and/or walking to improve individual health in a district: An Intervention study

Boonlue Chimbanrai*

School of Medicine, University of Phayao, Phayao Province 56000

*Correspondence to: boonluechim@gmail.com

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Abstract

The aim of the study was to examine the effect of walking or bicycling toward individual health parameter. The interventional study was carried out to assess health parameter among 87 subjects who complete regular physical activity with walking or bicycling for 10 months follow-up continuously. Post intervention (at the end of the study), all four means (SD) of health parameters included weight (kg), pulse (beat per minute), and systolic and diastolic blood pressure (mm Hg) were highly significant descent from 59.1 to 54.9, 82.4 to 73.3, and 129.6/86.9 to 126.6/82.1, respectively. In addition, the well-being had subjectively increased from baseline of 35 (40.2%) to 87 (100%) and satisfied with physical activity, non-physical activity, and social interactivity.

Keywords: Health, walking, bicycling

Introduction

At present, bicycling has gained attention aiming to increase levels of physical activity in children [1] and adults. [2-5] Regular physical activity range of health benefits, [6] and the World Health Organization recommends a minimal of 150 minutes of moderate physical activity per week. [7] But despite substantial benefits, increasing proportion of populations had failed to achieve recommendation levels of activity. Thus integrating bicycling into daily routines provides a promising approach to increase physical activity, given the many people who spend 30 minutes and more for commuting daily, yet struggle to fine the extra half-hour to exercise. [8,9]

A number of studies consistently demonstrate beneficial effects of exercise on hypertension with reductions in both systolic and diastolic blood pressure with as much as 5 to 7 mm Hg reduction in those with hypertension, [10-13] as well as body mass index among middle-aged and older population the exercises and low calorie high protein diet decrease body weight and fat mass. [14] The study aimed to examine the effect of walking or bicycling toward individual health parameter.

Material and Method

The interventional study was assessed among the regular exercise (walking and/or bicycling as tolerance) and body weight, blood pressure, and pulse rate. There were 123 volunteers of Pong district, Phayao province voluntarily participate in the study at baseline. Among these 87 subjects had complete the intervention thorough the 10-month period (5 follow-up), during October 2018 to September 2019. The eligible subjects of various age group of healthy population with or without underlying diseases were enrolled into the study. Before admission, the health promotion issues were introduced and basic health parameters as well at baseline, and bimonthly interval for 10 months. The subjects were suggested for bicycling and/or walking at least 30 minutes daily or more.

The demographic data included age, sex, education, and occupation. The specific data consisted of body weight, pulse rate, systolic and diastolic blood pressure.

The descriptive data were presented in term of number, proportion, and standard deviation (SD). The Analysis of variance (ANOVA) was used to determine whether there were any statistically significant different (p<0.05) between means of all follow-up parameters.

Results

The majority of the subjects (87 workers) were female of 53 (60.9%), average age of 55.8 years, house wife of 47 (54.0%), primary school education of 51 (58.6%). Among these, 14 (161%) had underlying diseases of hypertension (8), diabetes mellitus (4), and musculoskeletal condition (2).

At baseline, the average body weight (kg), pulse rate (beat per minute), systolic/diastolic blood pressure (mm Hg) were 59.1, 82.4, and 129.6/86.9, respectively. Post intervention (the end of 10-month follow-up), all four means (SD) of health parameters were highly significant descent to 54.9, 73.3, 126.6/82.1, respectively. **(Table 1)** The individual health parameters had been improved according to duration of physical, and the subjective perception of well-being had increased from baseline of 35 (40.2%) up to 10-month follow-up of 87 (100%), and their satisfaction not only physical activity but also non-physical activity such as social interactivity.

Table 1 Comparative means of health parameters at baseline, 2- 4- 6-, 8- and 10-month

Parameter (standard deviation)	baseline	2-month	4-month	6-month	8-month	10-month
Body weight - kg	59.1 (6.7)	58.0 (6.7)	56.6 (6.5)	55.4 (6.6)	54.7 (6.8)	54.9 (9.0)**
Pulse rate - beat per minute	82.4 (1.5)	80.5 (2.1)	78.3 (1.8)	76.5 (1.8)	74.8 (1.8)	73.3 (1.8)**
Systolic blood pressure - mm Hg	129.6 (5.7)	128.0 (6.1)	126.9 (5.5)	127.4 (5.4)	126.6 (5.5)	126.6 (5.5)**
Diastolic blood pressure - mm Hg	86.9 (5.2)	85.5 (5.1)	82.7 (3.7)	82.4 (3.8)	82.2 (4.0)	82.1 (3.7)**

** Highly significant p<0.001

Discussion

The present study, walking and bicycling had clearly demonstrated the individual health parameters were improved even though in the short term. However, the neglect of pedestrian and bicycling safety have to be concerned. Whereas, the wide range of exercise environment measurements, facilities and traffic regulation should be available to enhance safety. [15] The limitations of the study are the correlation of exercise and age and underlying disease.

The package program of the study is health promotion, walking and bicycling is a way that has dramatize the short term benefit to the participants, nevertheless any of exercise program are welcome. Walking and bicycling clearly would be the cheapest, not reliable, and most practical way to ensure adequate levels of physical exercise, and can be performed indoor (health club, home) and outdoor circumstance.

In addition, walking and cycling also help alleviative traffic congestion, save energy, reduce air and noise pollution, conserve land, and produce various other environmental benefits. So far, Thailand need the widespread public support for the impressive range of policies that could be adopted to make walking and bicycling safer, more convenient, and more pleasant. [15]

In conclusion, individual and public health among community probably has the high potential to encourage the changes at the grassroots level, with self-interest and strong motivation to effect change in behavior.

References

1. Trapp GSA, Giles-Corti, B, Christian HE, Bulsara M, Timperio AA, McCormack GR, et al. On your bike! A cross-sectional study of the individual, social and environmental correlates of cycling to school. Int J Behav Nutr Phy. 2011;8:123. Doi: 10.1186/1479-5868-8-123.
2. Beenackers MA, Foster S, Kamphuis CB, Titze S, Divitini M, Knuiman M, et al. Taking up cycling after residential relocation: Built environment factors. Am J Prev Med. 2012; 42(6):610-15.
3. Kohl WH 3rd, Craig CL, Lambert EV, Inoue S, Alkandari JR, Leetongin G, et al. The pandemic of physical inactivity: Global action for public health. Lancet. 2012;380(9838):294-305.
4. Rissel C, Merom D, Bauman A, Garrard J, Wen LM, New C. Current cycling, bicycle path use, and willingness to cycle more — findings from a community Survey of cycling in Southwest Sydney, Australia. J Phy Act Health. 2010;7(2);267–72.
5. Heesch KC, Giles-Corti B, Turrell G. Cycling for transport and recreation: Associations with socio-economic position, environmental perceptions, and psychological disposition. Prev Med. 2014;63, 29–35.
6. Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT. Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of diseases and life expectancy. Lancet. 2012; 380(9838):219–29.

7. World Health Organization. Global recommendations on physical activity for health. Geneva: World Health Organization, 2010. 60 p.
8. Bauman AE, Reis RS, Sallis JF, Wells JC, Loos RJ, Martin BW. Correlates of physical activity: Why are some people physically active and others not? Lancet. 2012; 380(9838):258–71.
9. Trost SG, Owen N, Bauman AE, Sallis JF, Brown W. Correlates of adults' participation in physical activity: Review and update. Med Sci Sports Exerc. 2002;34(12):1996–2001.
10. Pescatello LS, Franklin BA, Fagard R, Farquhar WB, Kelley GA, Ray CA. Exercise and hypertension: Med Sci Sports Exerc. 2004;36(3):533–53.
11. Fagard RH. Exercise Therapy in hypertensive cardiovascular disease. Prog Cardiovasc Dis. 2011;53(6):404–411.
12. Cornelissen VA, Smart NA. Exercise training for blood pressure: A systematic review and meta-analysis. J Am Heart Assoc. 2013;2(1): e004473. doi: 10.1161/JAHA.112.004473.
13. Carlson DJ, Dieberg G, Hess NC, Millar PJ, Smart NA. Isometric exercise training for blood pressure management: A systematic review and meta-analysis. Mayo Clin Proc. 2014;89(3):327–34.
14. Hsu KJ, Liao CD, Tsai MW, Chen CN. Effects of Exercise and nutritional intervention on body composition, metabolic health, and physical performance in adults with sarcopenic obesity: A meta-analysis. Nutrients. 2019;11(9):2163. Doi:10.3390/ nu11092163.
15. Pucher J, Dijkstra L. Promotion safe walking and cycling to improve public health: Lessons from the Netherlands and Germany. Am J Public Health. 2003;93(9):1509-16.