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Adjustment of the correct sitting position on bicycle of recreational cyclists : inspiration for physical education at school

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ABSTRACT

Introduction: In cycling we accept paradigm that the correct sitting position while riding a bicycle is a basic prerequisite for efficient pedaling. Many racing and recreational cyclists have sitting position set badly.

Aim of Study: The aim of our study is to describe the differences in adjustment of various sitting positions using the Retül technique in contrast to the original adjustment set by the rider himself.

Material and Methods: A research sample consisted of 42 recreational riders (18–50 years old) who were set up using the Retül technique and compared to the previous state of set-up.

Results: More than 80 % of riders had the sitting position set badly in main parameters (saddle height and handlebar drop, distance of the saddle and handlebar).

Conclusion: Conclusion: Overall, 83.4% of individuals had the sitting position set badly. After adjusting the correct sitting position on the bicycle, riders have created better conditions for the proper technique of pedaling a bicycle. We present recommendations for school physical education. The publication has been carried out within an internal grant PF UJEP 2018.

Keywords: cycling, Retül, sitting position

SOUHRN

Úvod: V cyklistice je uznáváno paradigma, že správný posed při jízdě na jízdním kole je základním předpokladem efektivního šlapání. Mnoho závodních i rekreačních cyklistů má tento posed nastaven špatně.

Cíl: Cílem naší studie je popsat rozdíly v nastavení posedu za pomoci techniky Retül a samotným jezdce.

Metody: Výzkumný vzorek tvořilo 42 rekreačních jezdců (18-50 let), kterým byl posed nastaven pomocí pomoci techniky Retül a srovnán s předchozím stavem nastavení posedu.

Výsledky: Více než 80 % jezdců mělo posed nastaven špatně v hlavních parametrech (výška sedla, drop, vzdálenost sedla a řídítek).

Závěr: Po nastavení správného posedu na jízdním kole byly jezdcům vytvořeny vhodnější podmínky pro správnou techniku šlapání na jízdním kole. Uvádíme doporučení využití i do školní tělesné výchovy. Publikace byla podpořena interním grantem PF UJEP 2018.

Klíčová slova: cyklistika, posed, Retül

INTRODUCTION

In cycling we accept paradigm that the correct sitting position while riding a bicycle is a basic prerequisite for efficient cycling (Ettema & Lora, 2009; Friel, 2009; Chavarren & Calbet, 1999; Schmidt, 1999; Wozniak, 1991). Correct sitting position on bike has a significant influence on cyclists health. It concerns especially articular mobility, correct muscle function and muscle dysbalance (Bertucci, Grappe, Girard, Betik, & Rouillon, 2005; Ettema & Lora, 2009; Wozniak, 1991). Many racing and recreational cyclists have this sitting position set badly, although there exists number of methods of its proper adjustment such as e.g. Body geometry fit, Guru fit bike, Retül (Vojtěchovský & Sekera, 2008).

Taking into consideration, that cycling belongs to popular physical activities even in physical education, it is possible to use the acquired knowledge in physical education (Lirgg, Gorman, Merrie, & Hadadi, 2018). Students can be ranked predominantly among recreational cyclists.

In our study, we focused on recreational cyclists, who decided to optimise their sitting position. The most frequent reasons of dissatisfaction with current sitting position were: health issues, purchase of new bicycle, improvement of performance at amateur races. The aim of our study is to describe the differences in adjustment of various sitting positions using the Retül technique in contrast to the original adjustment set by the rider himself and the main parameters will be: saddle height, drop, distance of saddle and handlebars.

METHODOLOGY

The research sample consisted of 42 individuals (18-50 years old male recreational cyclists, 166-194 cm body height, 3-25 years cyclically active, 2200-20 000 km kilometers per year) who were examined during the period of 2011 – 2013. We measured their main parameters of sitting position on their bicycle, that is; saddle height, drop, distance of saddle and handlebar (see Fig. 1). Therefore, their current state of sitting position was measured.

Afterwards the set-up of the new sitting position on bicycle was adjusted using the Retül technique. The basic biometric data is used to adjust the sitting position: knee extension, plantar ankle flexion, anteroposterior knee position, torso slope. In addition to these five core values, it is also important for individual settings: athlete's flexibility test, strength a leg and torso stability, possible body disbalance, etc. Followed by a final evaluation specialist in cooperation with the cyclist (Retül, 2018).

After this process the parameters were measured again according to Fig. 1., i.e. new sitting position. Current and new sitting position were compared using descriptive characteristics, Wilcoxon pair test and effect size.

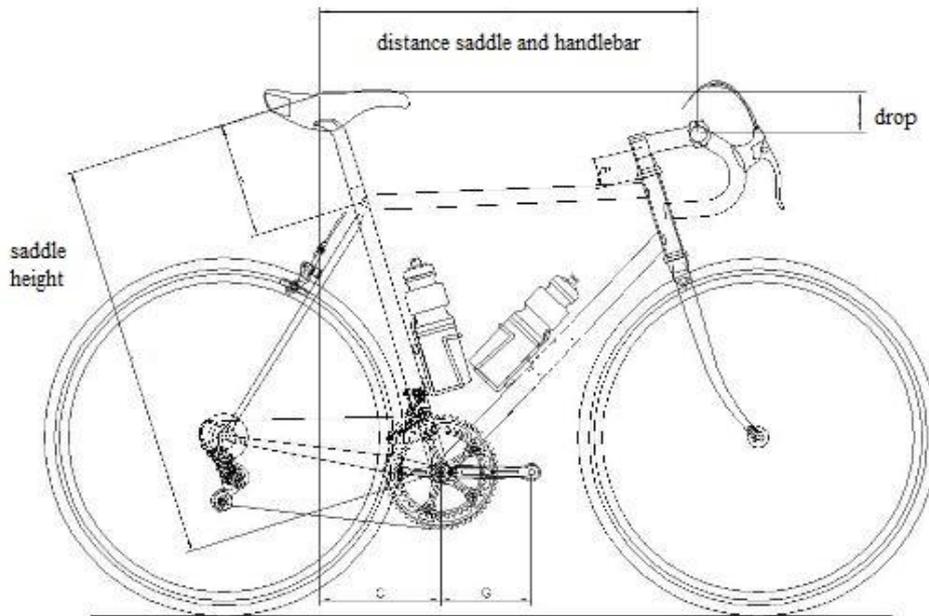


Fig. 1 Measured parameters of the sitting position on bike (Bikemine, 2018)

RESULTS

Based on descriptive statistical characteristics and pairwise comparison it can be stated that individuals had the biggest error of sitting position in saddle height. Here can be seen a high effect in terms of effect size. The average difference between the current and the new saddle height was $1,3 \pm 1,5$ cm. Maximum difference was found 4,4cm (n = 2).

Furthermore, it is also possible to statistically detect substantive significant difference of the drop parameter. Average difference between the current and the new drop was $0,6 \pm 1,9$ cm. The absolute difference was a maximum of 4,1 cm – detected only at one individual.

Overall, 83.4% of individuals had the sitting position set badly.

Table 1 Descriptive Statistics of the measured parameters

	Valid n	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Std.Dev.
Saddle height [cm]	42,0	75,9	75,0	66,0	90,0	73,0	78,5	5,0
Saddle height new [cm]	42,0	77,2	77,3	67,5	90,0	73,0	80,5	5,1
Distance saddle and handlebar [cm]	42,0	66,4	67,7	54,2	76,7	60,7	72,0	6,7
Distance saddle and handlebar new [cm]	42,0	66,7	68,5	53,7	78,0	62,5	71,2	6,5
Drop [cm]	42,0	7,3	7,3	2,5	12,0	6,0	8,5	2,3
Drop new [cm]	42,0	7,9	8,4	1,0	12,4	7,2	9,0	2,4

Caption: Std. Dev. = Standard deviation

Table 2 Wilcoxon pair test & effect size

	N	T	Z	p-level	effect size
Saddle height & Saddle height new*	42	57,000	4,443	0,000009	0,687 (high effect)
Distance saddle and handlebar & Distance saddle and handlebar new	42	293,500	0,352	0,724727	0,054 (no effect)
Drop & Drop new*	42	228,500	2,059	0,039471	0,316 (medium effect)

Caption: * statistically significant difference

DISCUSSION

We are aware that the parameters we examined can not be viewed only by itself but it must be taken in context with other (not examined) parameters that are taken into consideration while adjusting sitting position by the Retül technique we have chosen (Retül 2018). Certain role can be played by the workers experiences, who measures and finds data of individual and his sitting position or riding preference and health aspects (Vojtěchovský & Sekera, 2008).