FACTORS INFLUENCING THE DEGREE OF ERECTILE DYSFUNCTION IN BICYCLE RACE ATHLETES

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ABSTRACT

Objective: *This research aims to identify factors influencing the degree of erectile dysfunction in bicycle racing athletes.* ***Material & Methods:*** *This study used quantitative analysis and cross-sectional research design. Samples included in this research were 54 respondents in accordance to the inclusion and exclusion criteria of this study, and were willing to participate in this research. The data were collected using the IIEF-5 (International Index of Erectile Function-5) questionnaire. The data were then edited, coded and analyzed using Chi-square (bivariate analysis).* ***Results:*** *The results showed correlations between the degree of erectile dysfunction in bicycle race athletes and age (PR= 1.182; 95%CI= 0.403-3.465; p= 0.976), cycling history (PR= 0.462; 95% CI= 0.490-4363; p= 0.687), cycling frequency (PR=1.400; 95% CI= 0.299-6.560; p= 0.72), cycling duration (PR= 0.333; 95% CI= 0.074-1.507; p= 0.165), furthest cycling distance (PR= 0.883; 95% CI= 0.267-2.919; p= 1.00), and type of saddle (PR= 0.271; 95% CI= 0.481-1.547; p= 0.221) respectively.* ***Conclusion:*** *There were no significant correlation (p= >0.05) in all variables analyzed in this study.*

Keywords: *Erectile dysfunction, age, cycling history, cycling frequency, cycling duration, furthest cycling distance, type of saddle.*

ABSTRAK

Tujuan: *Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor yang memengaruhi derajat disfungsi ereksi pada atlet balap sepeda.* ***Bahan & Cara:*** *Jenis penelitian yang digunakan adalah analisis kuantitatif dan rancangan penelitian Cross – sectional. Sampel yang terlibat dalam penelitian ini adalah 54 responden yang dipilih berdasarkan kriteria inklusi dan eksklusi serta kebersediaan untuk berpartisipasi dalam penelitian ini. Data yang dikumpulkan menggunakan kuesioner IIEF-5 (International Index of Erectile Dysfunction). Setelah data terkumpul dilakukan pengeditan, pengodean dan pengolahan data secara statistik menggunakan Chi–square (analisis bivariat).* ***Hasil:*** *Hasil menunjukkan korelasi masing-masing antara derajat disfungsi ereksi pada atlet balap sepeda dengan usia (PR= 1.182, 95% CI= 0.403-3.465, p= 0.976), riwayat bersepeda (PR= 0.462, 95% CI= 0.490-4363, p= 0,687), frekuensi bersepeda (PR= 1.400, 95% CI= 0.299-6.560, p= 0.72), durasi bersepeda (PR= 0.333, 95% CI= 0.074-1.507, p= 0.165), jarak terjauh bersepeda (PR= 0.883, 95% CI= 0.267-2.919, p= 1.00) dan jenis saddle (PR= 0.271, 95% CI= 0.481-1.547, p= 0.221).* ***Simpulan:*** *Tidak ditemukan hubungan yang signifikan (p= >0.05) pada setiap variabel yang diteliti terhadap derajat disfungsi ereksi.*

Kata Kunci: *Disfungsi ereksi, usia, riwayat bersepeda, frekuensi bersepeda, durasi bersepeda, jarak terjauh bersepeda, jenis saddle.*

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INTRODUCTION

Erectile dysfunction is defined as a limitation or reduced ability to achieve or maintain an erection process that impact dissatisfaction during sexual intercourse.[1] The etiology of erectile dysfunction is multifactorial and can be classified into psychogenic, organic (neurotic, hormonal, arterial, and corporal veno-occlusive dysfunction), drug (antipsychotic, antidepressant, and antihypertensive), lifestyle, and trauma.[2] Based on a study in America conducted by The Massachusetts Male Aging Study (MMAS) in 1987 involving up to 1290 men ranging between 40-70 years old found that 52% of the subjects experienced erectile dysfunction with grade 3 as the minimum score (17. 2%), moderate (25.2%) and

severe (9.6%). Research conducted by The American Urology Association in 2004 showed Erectile Dysfunction (ED) in 115 out of 688 (17%) cyclists. Age stratification revealed ED prevalence rates of 27 %, 12%, 11%, and 21% in the 18 to 29, 30 to 39, 40 to 49, and above 50 age groups, respectively.[3]

Men who have erectile dysfunction commonly have a history of diabetes, ischemic heart disease, and vascular peripheral disease.[4-5] Those are considered as serious indicators that can disturb various life aspects, including quality of life and interpersonal relationships.[6]

The seating position in nose seat saddle bike will give pressure towards blood vessels and perineal nerve that cause damage over time. The gluteal muscle acts to reduce pressure in our body while seating in noseless seat saddle.[7]

OBJECTIVE

This research aims to identify factors influencing the degree of erectile dysfunction in bicycle race athletes. More specifically, this research aims to analyze 6 factors namely age, cycling history, cycling frequency, cycling duration, furthest cycling distance, and type of saddle.

MATERIAL & METHODS

This study was conducted at Velodrome Diponegoro Stadium in Semarang, Indonesia. This research was an observational analytic study with cross-sectional design. The sampling used the purposive sampling method. There were 54 bicycle race athletes who met the inclusion criteria.

The inclusion criteria include being married, sexually active, no history of diseases namely diabetes mellitus, hypertension, heart disease, psychogenic disorder, perineal or penile inflammation, the height of handlebar lower than the saddle, wears padded cycling short, aero seat position (30-45^{o}). While the exclusion criteria include having history of perineal trauma and surgery, stroke, vertebral injury, and consuming drugs (antipsychotic, antidepressant, and antihypertensive).

The independent variables of this study are age, cycling history, cycling frequency, cycling duration, furthest cycling distance, and type of saddle. While the dependent variable of this study is the degree of erectile dysfunction. The instruments used in this study were the International Index of Erectile Function (IIEF-5) questionnaire and Sexual Wellness among Athletes to identify correlations between the independent variables and the degree of erectile dysfunction.

This study used univariate analysis to describe the characteristic of the samples and bivariate analysis using chi-square test to identify the correlations and prevalence ratios with 95 % CI for each variable towards the degree of erectile dysfunction. This study had obtained ethical clearance from KEPK (Health Research Ethics Commission) number 137/EC/KEPK/FK-UNDIP/V/2019.

RESULTS

There are 28 subjects aged >50 years old and 26 subjects (difference of 2 subjects or 3.8%) aged <50 years. The test result showed 1.182 odd ratio, indicating that athletes aged >50 years old are estimated to have the same probability of having erectile dysfunction with athletes aged <50 years old.

There are 32 respondents with <10 years cycling history, and 22 subjects (difference of 10 subjects or 18.6%) with >10 years of cycling history. The test result obtained 0.462 odd ratio, indicating that athletes with cycling history of more than 10 years are estimated to have 0.4 times the probability of having erectile dysfunction as compared to athletes with a cycling history of less than 10 years.

There were 46 respondents with a cycling frequency of >4x/week, while 8 subjects (difference of 36 subjects or 74%) with a cycling frequency of <4x/week. The test result obtained 1.4 odd ratio, indicating that athletes who cycle for more than 4x/week are estimated to have 1.4 times more probability of having erectile dysfunction as compared to athletes who cycles for less than four times per week.

The cycling duration of 45 subjects is >3 hours, while 9 subjects (difference of 35 subjects or 66.6%) cycle for <3 hours. The test result obtained 0.3 odd ratio, indicating that athletes who cycle for more than three hours per week are estimated to have 0.3 times more probability of having erectile dysfunction as compared to athletes cycling for less than three hours per week.

The furthest cycling distance of 39 subjects are at distance of >400 km, while 15 subjects (difference of 39 subjects or 44.4%) have the furthest cycling distance of <400 km. The test result obtained 0.883 odd ratio, indicating that athletes with the furthest cycling distance of more than 400 km per

Table 1. Result of the Chi-square test of the influencing factors and ED.

Variable	Abnormal	Normal	Total	OR	95%CI	p-value
Age						
>50 Years	13	15	28	1.182	0.403-3.465	0.976
<50 Years	11	15	26			
Cycling History						
>10 years	11	11	22	0.462	0.490-4363	0.687
<10 years	13	9	32			
Cycling Frequency						
> 4 x/weeks	21	25	46	1.400	0.299-6.560	0.72
< 4 x/ weeks	3	5	8			
Cycling Duration						
> 3 Hours	18	27	45	0.333	0.074-1.507	0.165
< 3 Hours	6	3	9			
Furthest Distance						
> 400 km	17	22	39	0.883	0.267-2.919	1.00
< 400 km	7	8	15			
Type of saddle						
A	19	28	47	0.271	0.481-1.547	0.221
B	5	2	7			

week are estimated to have 0.8 times more probability of having erectile dysfunction as compared to athletes cycling less than 400 km per weeks.

The saddle type used by 47 athletes is typed A, while 7 athletes (difference of 47 subjects or 74%) used type B. The test result obtained 0.271 odd ratio, indicating that athletes who used type A saddle are 0.2 times more at risk of having erectile dysfunction as compared to athletes who used type B saddle.

The results showed that 30 subjects are in the normal category, while 24 subjects (difference of 30 subjects or 11.2%) are in the abnormal category. Athletes who cycle for less than 400 km per week and are estimated to have 0.8 times more probability of having erectile dysfunction as compared to athletes cycling less than 400 km per week.

DISCUSSION

The result of this study showed an insignificant p-value = 0.976, showing no correlation between age and degree of erectile dysfunction. This is not in accordance with a theory by MMAS (Massachusetts Male Aging Study) which states that there is an increased rate of erectile dysfunction as age increases. It is related to vascular degeneration and disturbed neuronal mechanism in corporal veno-occlusive dysfunction, thus causing erectile dysfunction.[8] This may happen because of the uneven numbers of athletes in the age groups, or because all athletes were wearing padded cycling shorts that can protect by relieving perianal pressure.[3,9] Further studies are needed, and we suggest the researchers make sure that the respondents are honest in filling the questionnaires, such as EHS (Erectile Hard Score) to assess penis size and hardness by palpation.[10-11]

No correlation was found between cycling history, frequency, and duration with the degree of erectile dysfunction; with p-value of 0.687, 0.72, and 0.165 respectively. This is not in accordance with a theory stating that longer period of sitting on the saddle will put pressure on the blood vessel and perineal nerves thus disrupting the vascularization of internal pudendal arteries that functions as blood drainage in the genital area (especially in the corpus cavernosum). This condition will cause damage by time and eventually leads to fibrosis and erectile dysfunction.[12-13] This may happen because there were more respondents with a cycling history of <10 years, whereas people with a history of cycling for more than 10 years are more at risk of having erectile dysfunction.[3] The total number of normal respondents with a cycling frequency of >4x/week was also more than those <4x/week, whereas those with >4x/week cycling frequency are at higher risk of having erectile dysfunction.[14] There were also higher

number of subjects with a total cycling duration of >3 hours/week, whereas this group is more at risk of having erectile dysfunction.[15]

There was no significant correlation between the furthest cycling distance and the degree of erectile dysfunction (p value= 1.00). This is not in accordance with the result of a previous study which reported that 23% of the cyclists that cycle for >400 km experienced perineal injuries and 13% had erectile dysfunction.[3] This may happen because most subjects of this research do not reach a cycling distance of >400 km in a week due to the lack of bicycle race competitions being held weekly.

The statistical chi-square test showed insignificant results (p-value= 0.221) between the type of saddle and the degree of erectile dysfunction. This is not in accordance with the theory yielded by the NIH (National Institute of Health) which states that nose saddle will put more pressure towards the perineum as compared to the noseless saddle, leading to the compression of the perineum which causes recurring perineal injuries resulting in erectile dysfunction.[7] This may be because the majority of respondents in this study uses type A saddle (long, small, and a little soft), whereas cyclist using type A saddle are more at risk of having erectile dysfunction as compared to those using type B saddle (longer, larger and softer than type A saddles).[16]

CONCLUSION

The result of this research showed insignificant correlations between all variables, namely age, cycling history, cycling frequency, cycling duration, cycling furthest, type of saddle, and the degree of erectile dysfunction. There was a bias in this research caused by the work of athletes. The researchers should measure blood pressure, including the work of athletes, and use additional questionnaires such as EHS (Erectile Hard Score) to assess penis size and penis hardness by palpation.

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