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CORRELATION BETWEEN PREVALENCE OF ERECTILE DYSFUNCTION AND LENGTH OF RIDING IN HOURS / WEEK AMONG BICYCLE TAXI RIDERS IN BUNGOMA, KENYA

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I. W. WASIKE, E. CHESEREM and F. KAGEMA

ABSTRACT

Background; Organic erectile dysfunction is common in elderly men but is not prevalent in men below 40 years of age (5). However, in addition to other known causes such as smoking, alcohol intake and diabetes mellitus, recent research has implicated bicycle riding as the cause of erectile dysfunction in much younger men (10). Even stationary bikes can cause trauma to the blood supply to the penis, resulting in erectile dysfunction (22).

Objective: To evaluate the effects of long hours of bicycle riding/week on erectile function among bicycle taxi (boda boda) riders in Bungoma town.

Design: A Cross-sectional survey.

Setting: Bungoma town, part of western Kenya, bordering Uganda to the west. There are believed to be 1300 bicycle taxi riders in Bungoma.

Subjects: Bicycle taxi riders aged below 40 years and married.

Results: A total of 115 participants were enrolled in this study. The overall prevalence of erectile dysfunction among bicycle taxi riders was 35.9%. The period of riding in months was not significantly associated with erectile dysfunction among bicycle taxi riders but the length of riding in hours per week was significantly associated with erectile dysfunction $p < 0.01$. The risk of erectile dysfunction increased as the hours of riding per week increased. None of those who rode for more than 60 hours per week had a normal erectile function.

Conclusion. Longer hours of bicycle riding per week, was associated with higher rates of erectile dysfunction among Boda boda taxi riders.

INTRODUCTION

Erectile dysfunction(ED) is a common condition that has affected men for centuries. Although it was considered a benign complaint, we now recognize that erectile dysfunction and sexual health have a profound impact on the overall health and quality of life of affected men and their spouses/partners (1).

Epidemiological studies show that the risk of erectile dysfunction increases with advancing age and that the typical patient with it is generally in his 50s or 60s, there is increasing evidence, however that it also occurs in much younger men(2). Erectile dysfunction may be caused by psychological factors or hormonal problems as well as chronic disease or acute injury (5). Recently, there has been growing interest in the role of bicycling in the development of erectile dysfunction particularly in young otherwise healthy men who lack the typical risk factors such as hypertension, elevated lipids, and cigarette smoking. Even stationery bikes

can cause trauma to the blood supply to the penis, resulting in erectile dysfunction (4, 6).

MATERIALS AND METHODS

This was a cross-sectional survey determining the prevalence of erectile dysfunction among bicycle taxi riders in Bungoma County.

Bungoma County is part of Western Kenya bordering Uganda to the west. Boda boda[bicycle taxi] riding is thought to have started at Chebukube border point in Bungoma county during the coffee boom of early 1970s as a means of smacking coffee into Kenya from Uganda. Now this mode of transport has become a major business among young men in Bungoma town.

It is approximated that there are 1300 bodaboda taxi riders in Bungoma town.

The study targeted bicycle taxi riders in five stations within the municipality (Kanduyi,

Ntengelwa, Musikoma, Bus stage, Mandisini). The participants were aged below 40 years and married, were from low and lower middle socioeconomic status and were able to understand Luhya, Kiswahili and English languages.

A total of 115 participants were interviewed: 115 bicycle taxi riders. Simple systematic sampling was used. Alternate taxi riders were sampled in each of the town bases and given numbers to avoid repetition. Participants were matched for age and duration of work. Using the prevalence ratio in the sample size, it was expected that 1 in 2 bicycle taxi riders has experienced erectile dysfunction in their life time during their work. Therefore in getting a sample of 114, at least 55 of them had experienced erectile dysfunction.

To assess the erectile function, the international index of erectile function questionnaire was used. Validated by Rosen RC, Riley A, Wagner G, et al. The international index of Erectile Function (IIEF): a multidimensional scale for assessment of erectile function, *Urology* 1997; 49:822-830.

Data analysis was done using SPSS Version 16.0. Data was cleaned by running frequencies and missing values were checked and corrected by referring to

questionnaires, descriptive statistics was carried out for both count variables (Age, duration of riding, or cutting sugarcane) and categorical variables. Measure of central tendency and dispersion were calculated for continuous variables. Some of the continuous variables were categorized to calculate proportions. Chi – Square test (Mantel-Haenssen summary Chi – Square test) was used to compare proportions and grouped variables. All significant variables in univariate analyses were analysed by multivariate models to determine independent predictors of effect on erectile function.

EPI INFO 3.3.2 February 2005, was used to calculate odds ratio of the effect of alcohol intake and smoking on erectile function in the two study groups.

Significance was set at P Value = 0.05. Qualitative analysis was done thematically with some quotes of key informants.

RESULTS

A total of 115 participants were interviewed, the mean age for bicycle taxi riders was 27.69 years and 82.6% of them were married.

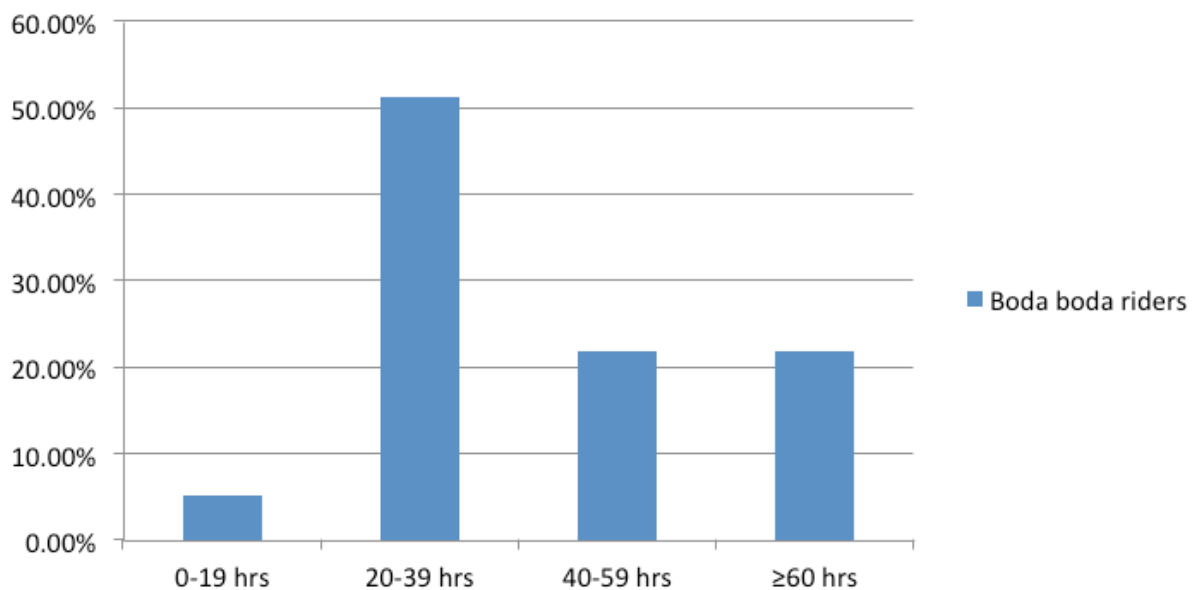
Table 1
Socio-demographic characteristics of study population

Characteristic	Frequency(n=115)	Percentage
Age in years		
≤28	71	61.7%
>28	44	38.2%
Age of spouse(years)		
≥25	63	54.8%
>25	52	45.2%
Marital Status		
Cohabiting	1	0.9%
Married	95	82.6%
Separated	9	7.8%
Divorced	7	6.1%
Widower	3	2.6%
Living With spouse		
Yes	102	88.7%
No	13	11.3%
Have other partners?		
Yes	27	23.5%
No	88	76.5%
Educational level		
≤secondary school	100	87.0%
>secondary school	15	13.0%
Religion		
Christian	99	86.1%
Non-Christian	16	13.9%
Spouse Occupation		
Employed	7	6.1%
Unemployed	108	93.9%
Length of Marriage		
≤4 years	64	55.7%
>4 years	51	44.3%

Table 2
Risk Factor Characteristics

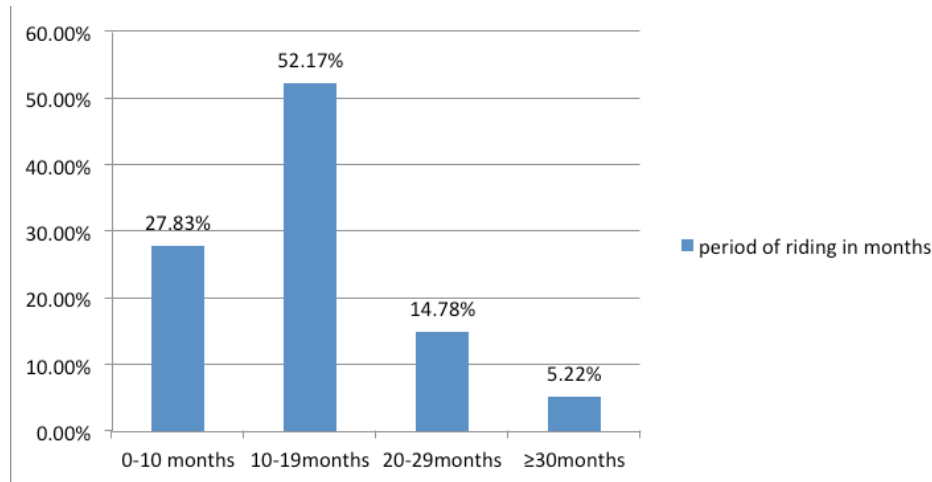
Characteristic	Frequency(n=115)	Percentage
Taking Alcohol		
Yes	66	57.4%
No	49	42.6%
Type of Alcohol		
Bottled	13	18.6%
Unbottled	57	81.4%
Quantity Taken		
≤2 units	33	49.3%
>2 units	37	50.7%
Frequency Of Taking Alcohol		
Daily	25	39.2%
Occasionally	45	60.8%
Smoking		
Yes	32	27.8%
No	83	72.2%
Type Smoked		
Cigarettes	30	85.7%
Others	5	14.3%

Figure 1
Length of working in hours per week



**Majority of bodaboda rode bicycles for more than 20 hours per week.*

Figure 2
Period of Bodaboda riding in months



*Majority of Bodaboda riders had been in business for 10-19 months.

Table 3
Correlation of overall erectile function score and risk factors among Bodaboda riders

	Score	6-10 severe dysfunction	11-16 moderate dysfunction	17-21 mild / moderate dysfunction	22-25 mild dysfunction	26-30 normal function	P value
Age	≤28	5(71.4%)	19(55.9%)	23(60.5%)	11(61.1%)	13(72.2%)	0.802
	>28	2(28.6%)	15(44.1%)	15(39.5%)	7(38.9%)	5(27.8%)	
Alcohol intake	Yes	4(57.1%)	20(58.8%)	20(52.6%)	12(66.7%)	10(55.6%)	0.904
	No	3(42.9%)	14(41.2%)	18(47.4%)	6(33.3%)	8(44.4%)	
Smoking	Yes	3(42.9%)	9(26.3%)	10(26.3%)	5(27.8%)	5(27.8%)	0.930
	No	4(57.1%)	25(73.5%)	28(73.7%)	13(72.2%)	13(72.2%)	
Period of riding in months	0-9	1(14.3%)	14(41.2%)	9(23.7%)	3(16.7%)	5(27.8%)	0.094
	10-19	5(71.4%)	16(43.1%)	25(65.8%)	7(38.9%)	7(38.9%)	
	20-29	1(14.3%)	3(8.8%)	3(7.9%)	5(27.8%)	5(27.8%)	
	≥30	0(0%)	1(2.9%)	1(2.6%)	3(16.7%)	1(5.6%)	
Length of riding in hours/week	0-19	0(0%)	0(0%)	1(2.6%)	4(22.2%)	1(5.6%)	0.000
	20-39	3(42.9%)	13(38.2%)	22(57.9%)	8(44.4%)	13(72.2%)	
	40-59	2(28.6%)	9(26.5%)	4(10.5%)	6(33.3%)	4(22.2%)	
	≥60	2(28.6%)	12(35.3%)	11(28.9%)	0(0%)	0(0%)	
Type of bicycle used	Mechanical	4(57.1%)	23(67.6%)	29(76.3%)	11(61.1%)	18(100%)	0.084
	Motorized	3(42.9%)	7(20.6%)	4(22.2%)	4(22.2%)	0(0%)	
	Both	0(0%)	4(11.8%)	5(13.2%)	3(16.7%)	0(0%)	
Type of bicycle seat saddle used	Padded	5(71.4%)	26(76.5%)	28(73.7%)	15(83.3%)	16(88.9%)	0.890
	Unpadded	1(14.3%)	2(5.9%)	4(10.5%)	1(5.6%)	0(0%)	
	Chair	1(14.3%)	6(17.6%)	6(15.8%)	2(11.1%)	2(11.1%)	

Longer hours of ridding per week were significantly associated with severe erectile dysfunction.

Table 4
Correlation of overall quality of erection category and risk factors for bodaboda riders

		Severe ED	Normal	P value
Age	≤28	28(68.3%)	43(58.1%)	0.282
	>28	13(31.7%)	31(41.9%)	
Alcohol	Yes	23(56.1%)	43(58.1%)	0.835
	No	18(43.9%)	31(41.9%)	
Smoking	Yes	11(26.8%)	21(28.4%)	0.859
	No	30(73.2%)	53(71.6%)	
Period of riding in months	0-9	14(34.1%)	18(24.3%)	0.718
	10-19	19(46.3%)	41(55.4%)	
	20-29	6(14.6%)	11(14.9%)	
	≥30	2(4.9%)	4(5.4%)	
Length of riding in Hours/week	0-19	0(0%)	6(8.1%)	0.224
	20-39	20(48.8%)	39(52.7%)	
	40-59	10(24.4%)	15(20.3%)	
	≥60	11(26.8%)	14(18.9%)	
Type of bicycle used	Mechanical	25(61.0%)	60(81.1%)	0.046
	Motorized	10(24.4%)	8(10.8%)	
	Both	6(14.6%)	6(8.1%)	
Type of bicycle seat saddle used	Padded	29(70.7%)	61(82.4%)	0.342
	Unpadded	4(9.8%)	4(5.4%)	
	Chair	8(19.5%)	9(12.2%)	

Non- motorized bicycles were significantly associated with severe erectile dysfunction.

Table 5
Correlation of hardness of erection score and risk factors

	Score	0	1	2	3	4	P value
Age	≤28	1(100%)	6(85.7%)	10(55.6%)	6(60%)	48(60.8%)	0.616
	>28	0(0%)	1(14.3%)	8(44.4%)	4(40%)	31(39.2%)	
Alcohol	Yes	1(100%)	2(28.6%)	9(50%)	9(90%)	45(57.0%)	0.096
	No	0(0%)	5(71.4%)	9(50%)	1(10%)	34(43.0%)	
Smoking	Yes	0(0%)	0(0%)	5(27.8%)	3(30%)	24(30.4%)	0.499
	No	1(100%)	7(100%)	13(72.2%)	7(70%)	55(69.6%)	
Period of riding in months	0-9	1(100%)	2(28.6%)	6(33.3%)	1(10%)	22(27.8%)	0.767
	10-19	0(0%)	3(42.9%)	8(44.4%)	7(70%)	42(53.2%)	
	20-29	0(0%)	1(14.3%)	4(22.2%)	1(10%)	11(13.9%)	
	≥30	0(0%)	1(14.3%)	0(0%)	1(10%)	4(5.1%)	
Length of riding in hours/week	0-19	0(0%)	0(0%)	0(0%)	1(10%)	5(6.3%)	0.525
	20-39	0(0%)	2(28.6%)	10(55.6%)	6(60%)	41(51.9%)	
	40-59	1(100%)	2(28.6%)	2(11.1%)	2(20%)	18(22.8%)	
	≥60	0(0%)	3(42.9%)	6(33.3%)	1(10%)	15(19%)	
Type of bicycle used	Mechanical	1(100%)	6(100%)	12(66.7%)	6(60%)	60(75.9%)	0.05
	Motorized	0(0%)	0(0%)	5(27.8%)	0(0%)	13(16.5%)	
	Both	0(0%)	0(0%)	1(5.6%)	4(40%)	6(7.6%)	
Type of bicycle seat saddle used	Padded	0(0%)	5(71.4%)	13(72.2%)	9(90%)	63(79.7%)	0.146
	Unpadded	1(100%)	1(14.3%)	2(11.1%)	0(0%)	13(16.5%)	
	Chair	0(0%)	1(14.3%)	3(16.7%)	1(10%)	3(3.8%)	

Non-motorized bicycles were significantly associated with poor erectile hardness score, however length of riding in hours/week was not.

Table 6
Correlation of sexual characteristics and erectile function score among bodaboda riders

Characteristic	Score	6-10 severe dysfunction	11-16 moderate dysfunction	17-21 mild/moderate dysfunction	22-25 mild dysfunction	26-30 normal function	P Value
Level of sexual desire	low	5(4.4%)	17(14.7%)	15(13.0%)	3(2.6%)	0(0%)	
	High	2(1.7%)	17(14.7%)	23(19.9%)	15(13.0%)	18(15.7%)	
Overall satisfaction with sex life	Very dissatisfied	7(6.1%)	16(13.9%)	16(13.9%)	3(2.6%)	0(0%)	
	Satisfied	0(0%)	18(15.6%)	22(19.1%)	15(13.0%)	18(15.6%)	
Satisfactory sexual relationship with spouse	Very dissatisfied	5(4.4%)	20(17.4%)	3(2.6%)	2(1.7%)	0(0%)	
	satisfied	2(1.7%)	14(14.1%)	35(30.4%)	16(14.0%)	18(15.6%)	

The level of sexual desire, overall satisfaction with sexual life and satisfactory relationship with spouse were significantly associated with the erectile function score. Those with higher scores had higher levels of sexual desire and satisfactory sexual life.

Table 7
Correlation of sexual characteristics and overall quality of erection among bodaboda riders

Characteristic		Severe ED	Normal	P Value
Level of sexual desire	low	27(23.5%)	13(11.3%)	0.000
	high	14(12.2%)	61(53.1%)	
Overall satisfaction with sex life	Very dissatisfied	23(20.0%)	19(16.5%)	0.006
	satisfied	18(15.6%)	55(47.8%)	
Satisfactory sexual relationship with spouse	Very dissatisfied	23(20.0%)	7(6.1%)	0.000
	Satisfied	18(15.6%)	67(53.1%)	

There was significant association between the level of sexual desire, the overall satisfaction with sex life and satisfactory sexual relationship with spouse, with the overall quality of erection among bodaboda riders.

Table 8
Correlation of sexual characteristics and hardness of erection score among bodaboda riders

Characteristic	Score	0	1	2	3	4	P value
Level of sexual desire	low	1(0.9%)	7(6.1%)	11(9.5%)	4(3.5%)	17(14.8%)	0.000
	high	0(0%)	0(0%)	7(6.0%)	6(6.2%)	62(63.5%)	
Overall satisfaction with sex life	Very dissatisfied	1(0.9%)	5(4.4%)	10(8.7%)	4(3.5%)	22(18.7%)	0.006
	satisfied	0(0%)	2(1.8%)	8(6.9%)	6(6.2%)	57(49.6%)	
Satisfactory sexual relationship with spouse	Very dissatisfied	1(0.9%)	5(4.8%)	8(6.9%)	3(2.6%)	13(11.3%)	0.000
	Satisfied	0(0%)	2(1.8%)	10(8.7%)	7(6.0%)	66(57.4%)	

Higher erectile hardness scores were associated with higher levels of sexual desire, overall satisfaction with sex life and satisfactory sexual relationship with spouse.

DISCUSSION

This was a cross-sectional survey evaluating the effect of long term bicycle taxi (bodaboda) riding on erectile function among bicycle taxi riders in Bungoma town. The sample size was 115 participants. The study groups had comparable age, age of their spouses and marital status except for one bicycle taxi rider who

was cohabiting, nine were separated, seven divorced and three Widower.

The overall prevalence of ED among bodaboda riders based on international index of erectile function score was 35.7%, which corresponds to the findings in; Sexual dysfunction in the U.S survey; prevalence and predictors of 31% (3). The study by E Oksuz and colleagues (9), 2005, showed a prevalence of

ED of 33% among Turkish men aged 20 - 40 years. The period of riding in months was not significantly associated with ED, but there was a strongly significant association between the length of riding in hours per week and the erectile function $p < 0.01$. The risk of erectile dysfunction increased as the length of riding increased. None of those who rode more than 60 hours a week had normal erectile function. In a study of erectile dysfunction after long distance cycling (31), (Joseph R. and colleagues, 2004) showed 31% prevalence of erectile dysfunction among 463 cyclists (RR 4.4 95% CI 1.6-2.7). Most recommended that those entering into the boda boda business should minimize the number of hours they ride daily in order to maintain their sexual function. Asked why, one commended that, "I have separated twice due my inability to perform since one started this business".

The lack of association between period of riding and erectile dysfunction may have been due to intermittent breaks taken by the boda boda riders from this business allowing recovery from exhaustion and perinea! Injuries from the bicycle seats. In their study Joseph R and colleagues (7) also found the cumulative incidence of erectile dysfunction reduced as the duration of rest from riding increased.

Majority lived with their spouses, those who had other sexual partners had a significant association with erectile function, the overall quality of erection and the hardness of erection score. There was significant difference among boda boda riders with other sexual partners and those without other spouses in; erectile function $p < 0.05$, overall quality of erection $p < 0.05$, Hardness of erection score $p < 0.05$. Having other sexual partners was associated with increased risk of erectile dysfunction. In their study, among the Ariaal of northern Kenya, 2002, (8) P Gray and co workers, showed a significant relationship between the number of spouses and erectile dysfunction ($p < 0.05$), there was increased reporting of erectile dysfunction among men with multiple spouses.

Bicycle taxi riders (boda boda), who had other occupations had a significant difference with those doing only boda boda business in terms of; erectile function $p < 0.05$ with having other occupation being associated with higher risk of erectile dysfunction. However there was no significant difference in terms of quality of erection and hardness of erection.

There was no significant difference in the length of marriage and the erectile function, quality of erection and the erection hardness score among the bicycle taxi riders.

Taking alcohol or smoking was not significantly associated with erectile dysfunction. However, E Oksuz and colleagues (11), 2005, found alcohol intake and smoking as the most important risk factors for erectile dysfunction.

In conclusion, longer hours of bicycle riding per week were associated with greater risk of erectile dysfunction.

Higher scores of erectile function, quality of erection and the erection hardness score were significant predictors of sexual desire, overall satisfaction with sexual life and satisfactory sexual relationships with spouses among the boda boda riders.

Majority of boda boda riders with erectile dysfunction consulted local herbalists and received herbal treatment.

We recommended that; Bicycle riders should be counseled to work for less hours and rest more to decrease the risk of erectile dysfunction and increase marital sexual satisfaction.

Local health personnel should be educated on the risk factors and management of erectile dysfunction. More studies with larger sample sizes should be done to find the relationship between erectile dysfunction and the other risk factors.

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