EPIDEMIOLOGY

Male Sexual Quality Of Life Is Maintained Satisfactorily Throughout Life In The Amazon Rainforest

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ABSTRACT

Introduction: The Amazon Rainforest is a cradle of biodiversity, where different ethnic groups have specific sexual habits.

Aims: To define the average sexual quality of life of Amazonian men 18 to 69 years old, evaluate the influence of aging on their sexual function, and calculate the prevalence of premature ejaculation, delayed ejaculation, and hypoactive sexual desire disorder.

Methods: A cross-sectional quantitative probability sample study was performed with a demographically representative population (N = 385), with data collected privately at participants' houses, including men who had been sexually active for a minimum of 6 months. The Male Sexual Quotient (MSQ) was used to measure sexual satisfaction and function. Statistical analysis was performed with SPSS 21.0 using the Kruskal-Wallis test ($P < .05$), and a multiple linear regression analysis was performed to investigate which factors could predict participants' quality of sexual life.

Main Outcome Measures: MSQ scores.

Results: The response rate was 81.69%. The mean age was 36.00 ± 12.95 years, and most men had mixed ethnicity (63.11%), were self-employed (42.07%), had a monthly earned income of US$0 to US$460 (46.75%), and were single (36.10%). The mean MSQ score was 80.39 ± 12.14 (highly satisfied). None of the demographic characteristics showed a statistically significant influence on sexual satisfaction. The difference in quality of sexual life was statistically significant compared with age ($P < .01$). The domains of desire ($P < .01$), partner satisfaction ($P = .04$), and erection quality ($P < .01$, $P = .03$, $P = .02$) were statistically significant. Prevalences of sexual dysfunctions were 36.54% for premature ejaculation, 6.5% for delayed ejaculation, and 11.69% for hypoactive sexual desire disorder.

Conclusions: Independent of age, these men have an excellent quality of sexual life. Sexual domains such as desire, partner satisfaction, and erection quality are related to the correlation between sexual quality of life and aging. However, the prevalence of premature ejaculation seems to be slightly higher than in other parts of the world. **Teixeira T, Nazima M, Hallak J. Male Sexual Quality Of Life Is Maintained Satisfactorily Throughout Life In The Amazon Rainforest. Sex Med 2018;6:90–96.**

Key Words: Quality of Life; Sexual Health; Men's Health; Premature Ejaculation

INTRODUCTION

The Amazon region is a cradle of biodiversity for flora and fauna with the largest number of species on the planet in a spectacular rainforest. What is not so well known is that it is a land of diversity, where the current population is composed of a mixture of different ethnic groups, such as Europeans, mainly descendants of Portuguese colonizers, Africans, and a large number of indigenous populations (although the exact number is uncertain).

The multicultural society living in this unique environment results in specific habits, including sexual habits. These habits are

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probably different in the quality and prevalence of sexual functions and dysfunctions than those found in other industrialized urban centers in Brazil and elsewhere.

Our work focused on defining the average quality of sexual life of men living in a city in the Brazilian Amazonian region. We evaluated the influence of aging on the quality of sexual life of this population, highlighting which aspects of different sexual domains of male quality of life were most influential. We also calculated the prevalence of premature ejaculation (PE), delayed ejaculation (DE), and hypoactive sexual desire disorder (HSDD).

METHODS

This cross-sectional, quantitative, probability, sample study was performed in a demographically representative population of Amazonian men 18 to 69 years old who lived in Macapa, Amapa, Brazil. All data were collected confidentially.

Macapa is an unusual and very particular city of the Brazilian Amazon that preserves the multiplicity of indigenous and African cultures with urban habits. The Amazon River insulates it geographically so that there are no road connections to other Amazonian developed cities, and it is far from any industrialized metropolis. The State of Amapa has 96% of its territorial land covered by an intact rainforest and shares a border with French Guiana, a European overseas territory that still exerts a certain economic and social influence in local communities.

According to the 2010 Brazilian census, there were 111,560 men 18 to 69 years old who lived in Macapa. We used the Cochran theory to calculate a sample of 383 men, which was stratified into demographically representative groups of the population, in accordance with ages and education levels presented in this census. We included Portuguese-speaking men who had been sexually active for a minimum of 6 months and who had lived in the study area for the same period. The exclusion criterion was an inability to communicate in Portuguese. Participants were informed about the aims of the research and the ethical aspects involved. Questions about study design and a questionnaire were answered by a single researcher of the same sex at a private interview at the participants' homes. This research was conducted according to the ethical guidelines of the Declaration of Helsinki and was approved by the institutional review board. All participants provided written informed consent.

Classification of quality of sexual life and prevalence of sexual dysfunction were derived from responses to a sex-specific and Brazilian-designed validated questionnaire, the Male Sexual Quotient (MSQ).[1] This instrument was developed to measure sexual satisfaction and function in different aspects of male sexuality (desire, confidence, foreplay quality, partner satisfaction, quality of erection, ejaculation control, ability to achieve orgasm, and overall satisfaction with sexual intercourse). The MSQ was designed as a 10-item self-report questionnaire to be answered using a graded scale of 0 to 5 based on frequency and level of satisfaction—similar to a Likert scale (0 = never to 5 = always). Therefore, higher scores indicated a better quality of sexual life. The scores for all 10 items were summed and multiplied by 2, resulting in a final quotient score that included a 100-point scale and was classified into categories.[1]

Another important feature of this instrument is the possibility of identifying the presence of ejaculatory problems and HSDD. To estimate the prevalence of each of these sexual dysfunctions, we used the proportion of men with a response score no higher than 2 for each item: HSDD (question 1), "Is your desire strong enough to encourage you to initiate sexual intercourse?" PE (question 8), "Can you control ejaculation so that sexual activity lasts as long as you want?" DE (question 9), "Can you reach orgasm during sex?"

In accordance with the 2010 Brazilian census, approximately 30% of men living in this particular area were illiterate or had only a few years of formal education. Therefore, we used male interviewers to collect data from men who had difficulties reading written Portuguese. For the rest of the study sample, we maintained the self-report privacy of the MSQ.

Statistical analysis was performed to determine the central tendency measures and to verify the level of significance among the different age groups for quality of sexual life, with approximately 95% CIs. We used non-parametric tests such as the Mann-Whitney and Kruskal-Wallis tests, depending on the number of data analyzed. To verify the influence of age on the different aspects of the male sexual cycle that contribute to the quality of sexual life, the mean individual scores of each MSQ item were calculated for each age group and then compared using the Kruskal-Wallis test. Multiple linear regression analysis was performed to investigate which demographic data and estimated sexual dysfunctions could predict the quality of sexual life evaluated by the MSQ. The significance level was set at a P value less than .05.

All analysis was performed with SPSS 21.0 (IBM Corp, Armonk, NY, USA).

RESULTS

In February 2014, a group of 486 men 18 to 69 years old were invited to participate in the study at their homes by the interviewers. Of these men, 89 declined the invitation, for a response rate of 81.69%. 12 participants answered the questionnaires incompletely so the final sample analyzed consisted of 385 men, a number close to the sample calculated previously (n = 383).

The mean age of participants was 36.00 ± 12.95 years (95% CI = 34.70−37.30). The median age was 34.00 years. Figure 1 shows the distribution of the frequency of the study population stratified by age into demographically representative groups. For education level, almost 40% had 11 to 16 years of formal education, whereas 32.20% were illiterate or had up to 8 years of formal education. Most men in the sample had mixed ethnicity (63.11%), were self-employed (42.07%), were single (36.10%),

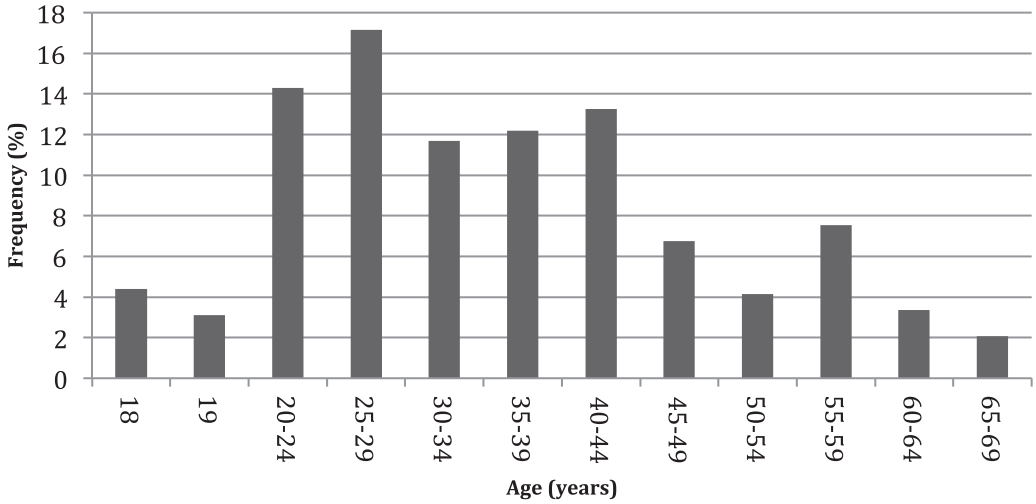

Figure 1. Frequency of demographically representative quota of male population stratified by age, Macapa, Brazil.

and had a monthly earned income of US$0 to US$460 (46.75%). Epidemiologic characteristics are presented in Table 1.

For sexual satisfaction using the MSQ, quality of sexual life of Amazonian men 18 to 69 years old showed an average score of 80.39 ± 12.14, classified as highly satisfied (95% CI = 81.60−9.17). The median score was 84.00 (maximum = 100.00, minimum = 34.00, range = 66.00).

Table 1. Baseline demographic data of studied population

Demographics	n (%)
Education level (years of studying)	
Illiterate or up to 8	124 (32.20)
8–10	67 (17.40)
11–14	151 (39.22)
≥15	43 (11.16)
Ethnicity	
Mixed	243 (63.11)
White	63 (16.36)
Black	62 (16.10)
Asian	10 (2.59)
No answer	7 (1.81)
Marital status	
Single	139 (36.10)
Married	109 (28.31)
Living with partner	115 (29.87)
Divorced or widowed	22 (5.71)
Work status	
Self-employed	162 (42.07)
Public agent	54 (14.02)
Private sector employee	107 (27.79)
Farmer	1 (0.25)
Student	32 (8.31)
Retired	9 (2.33)
Temporarily not working	12 (3.11)
Other	8 (2.07)
Monthly earned income (US$)	
0–460	180 (46.75)
461–920	109 (28.31)
921–1,150	37 (9.61)
≥1,151	59 (15.32)

There was an age-related increase from 18 years (79.99 ± 12.82; moderately satisfied) to 35 to 39 years (85.91 ± 10.85; highly satisfied) and a subsequent age-related decrease at 65 to 69 years (72.44 ± 18.44; moderately satisfied), with a second peak at 55 to 59 years (80.02 ± 13.24; highly satisfied). Quality of sexual life was statistically significant compared with age ($P < .01$ by Kruskal-Wallis test; Figure 2).

When calculating the mean individual scores of each MSQ item for each age group and after comparison using the Kruskal-Wallis test, 5 questions were statistically significant: question 1, "Is your desire strong enough to encourage you to initiate sexual intercourse?"($P < .01$); question 4, "Is your own sexual performance affected by your partner's sexual satisfaction?"($P = .04$); question 5, "Can you maintain an erection sufficient to complete sexual activity in a satisfactory way?"($P < .01$); question 6, "After sexual stimulation, is your erection hard enough to ensure satisfying intercourse?"($P = .03$); and question 7, "Can you consistently obtain and maintain an erection whenever you have sexual activity?"($P = .02$).

The prevalences of sexual dysfunctions were 36.54% for PE, 6.5% for DE, and 11.69% for HSDD.

After checking for linearity assumptions and normal distribution and non-correlation errors, multiple linear regression analysis demonstrated that the combination of all 3 sexual dysfunctions studied was the best model to predict sexual satisfaction for this specific population ($F_{3, 381} = 60.67$, $P < .001$). Almost 32% of the MSQ variance can be explained by this model (adjusted $R^2 = 0.318$; Table 2). DE was the sexual dysfunction that had the most negative influence on the quality of sexual life of these men (B = −19.081 ± 3.786). In this analysis, none of the demographic characteristics showed a statistically significant influence on sexual satisfaction (Table 3).

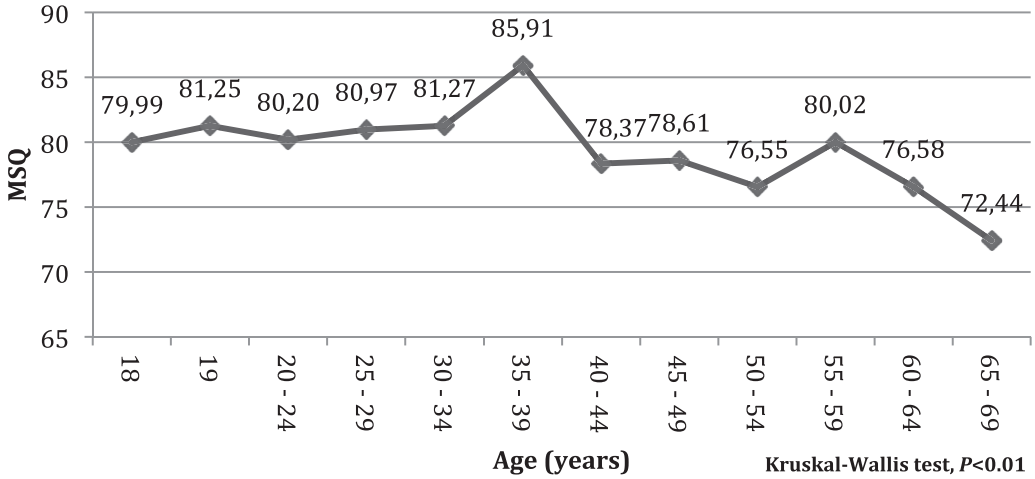

Figure 2. Distribution of MSQ score by age, Macapa, Brazil. MSQ = Male Sexual Quotient.

DISCUSSION

This research explores in a broad perspective the quality of male sexual life in a particular environment in the world, the Amazonian region, where men maintain excellent to good sexual satisfaction even with aging (Figure 2).

Our work obtained one of the highest response rates (81.69%) in the literature compared with other important sexual population studies, such as the National Health and Social Life Survey (NHSLS), the Health Professionals Follow-up Study (HPFS), the Men in Australia Telephone Survey (MATeS), and the National Health and Nutrition Examination Survey (NHANES).[2–5] This was achieved because of the study's well-designed methodology and face-to-face approach of a single same-sex researcher who collected data confidentially at participants' homes. This resulted in a high-quality level of responses and reliable data.

A face-to-face interview for sexual surveys can lead to less disclosure of sexual attitudes and behaviors, especially among illiterate participants and the Latino population; however, interviewers also can motivate participants by explaining the rationale and format of the survey and reinforcing the importance of the study.[6] Lindau et al[7] used a similar approach to obtain sexual data from a North American urban population, which included a Latino-American population, and obtained an excellent response rate of approximately 75%. Probably this approach improves men's trust, which not only increases the chance of participation in the research but also increases the likelihood of veracity in their answers to the questionnaire.

This study demonstrates that a highly satisfactory quality of sexual life is maintained for much of the adult life of men living in a non-industrialized Brazilian Amazonian city. Even older men (65–69 years) had an above average classification for their sexual satisfaction (Figure 2). In this population the sexual domains of desire (MSQ item 1), partner satisfaction (item 4), and quality of erection (items 5–7) were statistically positively significant. Many factors can contribute to these findings.

Healthy behaviors are associated with a lower risk for erectile dysfunction and, in consequence, better sexual satisfaction. Maiorano et al[8] found that the Mediterranean diet conferred a benefit in prevention and against deterioration in men with newly diagnosed type 2 diabetes. The Amazonian diet, which is rich in river fish, different fruits, Brazilian nuts, and green vegetables, is quite similar to the Mediterranean diet, which probably helps to sustain a better erection quality during the lifespan.[9]

This male population lives in an area where most of the native vegetation is intact (70% of the rainforest is totally preserved), and there are no large factories in the region, keeping the environment unpolluted. Exposure to air pollutants, such as carbon monoxide, nitrogen oxides, and products of motor vehicle

Table 2. Summary of model of multiple linear regression analysis

Model	R	R^2	Adjusted R^2	SEE	ANOVA*	Sum of squares	df	Mean square	F	Significance
All 3 sexual dysfunctions	0.569	0.323	0.318	10.030	Regression	18,313.954	3	6,104.651	60.673	0.000†
					Residual	38,334.726	381	100.616		
					Total	56,648.680	384			

ANOVA = analysis of variance; SEE = standard error of estimate.
*Dependent variable: Male Sexual Quotient.
†Predictors (constant): premature ejaculation (regression), delayed ejaculation (regression), hypoactive sexual desire disorder (regression; $P < .01$).

Table 3. Coefficients of the model of multiple linear regression analysis

Model	Unstandardized coefficients		Standardized coefficients	t	Significance	95.0% CI for B		Correlations			Collinearity statistics	
	B	SE	β			Lower bound	Upper bound	0 order	Partial	Part	Tolerance	VIF
MSQ (constant)	84.871	0.643		132.029	0.000	83.608	86.135					
PE (regression)	−9.807	1.087	−0.389	−9.021	0.000	−11.945	−7.670	−0.456	−0.420	−0.380	0.954	1.049
DE (regression)	−19.081	3.786	−0.221	−5.040	0.000	−26.524	−11.638	−0.317	−0.250	−0.212	0.923	1.083
HSDD (regression)	−13.403	2.815	−0.213	−4.762	0.000	−18.938	−7.869	−0.356	−0.237	−0.201	0.890	1.124

DE = delayed ejaculation; HSDD = hypoactive sexual desire disorder; MSQ = Male Sexual Quotient; PE = premature ejaculation; VIF = variance inflation factor.

exhaust, are negatively associated with the level of testosterone in men,[10,11] which could influence the prevalence of HSDD, although the prevalence of this specific sexual dysfunction calculated in our research (11.69%) was not different from that in other studies in completely different environments.[12–14]

Macapa, because of its equatorial latitude (0°), is in a region with the highest incidence of direct solar radiation and therefore a lower probability of vitamin D deficiency. A higher vitamin D level has been associated with a lower prevalence of hypogonadism in men.[15,16]

In the analysis of quality of sexual life with aging (Figure 2), the ascending curve from 18 to 39 years represents the evolution of sexual maturity, with progressive acquisition of experience and confidence in sexual performance and in personal achievements such as stable intimate relationships. The 2nd peak of improvement of quality of sexual life of this population (55–59 years) could represent the fact that men at that age reorganize their sexual behavior according to their physical limitations, increasing their sense of acceptance in not having sex as often as they did when they were younger.[17]

Another aspect that effectively contributes to the age-related distribution of quality of sexual life in this Amazonian male population is partner satisfaction, which is similar to other international studies.[18,19]

Despite the decrease in sexual satisfaction in the older men in the present research, they are still classified as moderately satisfied, showing that there are other predictors of sexual satisfaction that counteract the increase in sexual dysfunctions, chronic diseases, and the decline of sexual desire in aging. Sánchez-Fuentes et al[20] suggested that such predictors as a greater intimacy with the partner and positive sexual attitudes, such as concern with each other's satisfaction rather than with the sexual act, are important. They also stated that aspects of the interpersonal relationship such as good communication between partners, an assertive behavior from a sexual point of view, and high satisfaction with the relationship are strongly associated with sexual satisfaction, improving the qualitative sexual aspect of men in any age group.

This research also aimed to calculate the prevalence of PE, DE, and HSDD, which are sexual dysfunctions less studied in Brazilian men. Although this population (Figure 1) could be considered small (n = 385) and very young (mean age = 36 years, median age = 34 years) for a sexual dysfunction epidemiologic study,[21] this sample demographically represents the male population of a city that is isolated from other urban areas by the Amazon River and hundreds of square kilometers of dense rainforest. Therefore, this survey constitutes a very important instrument for planning the universal coverage of the Brazilian Public Health System,[22] including its Male Health Program, for cities in Amazonia in large areas with low population density and difficult geographic access and very likely could represent the reality of isolated populations in the world, with less contact with ultra-processed foods, environmental pollution, endocrine

disruptors, stress, anxiety, excessive use of antidepressants, and other harmful aspects of the postmodern lifestyle.

There are no statistical differences between this Amazonian male population and others in different parts of the world for the dysfunctions of HSDD and DE.[2,3,12,13]

For PE, the prevalence calculated for this population (36.54%) is slightly higher than that found in the literature, which varies from 8% to 30%. This large range of prevalence probably reflects the different types of definitions used for this dysfunction in the various studies.[21,23]

In research on the topic, PE is usually defined as an inability to delay ejaculation.[21,24] Despite criticism of this definition, it is well suited for estimation in population surveys, because they are usually performed through self-report questionnaires; it is a standardized method with an excellent cost-benefit ratio with great correlation with the clinical diagnosis of this sexual dysfunction.[25]

A recent meta-analysis suggested that PE can increase the risk of erectile dysfunction 4-fold, independent of the definition used for PE, highlighting that this risk is greater for the elderly.[26] In this Amazonian male population, despite the high prevalence of PE, participants maintain high sexual satisfaction levels because the mean age of the population was younger than 40 years, probably decreasing the risk of erectile dysfunction.[27] The definition of PE used in our survey did not take account for frustration in either partner and self-esteem or self-image problems in the male partner,[28] preventing the assessment of the multidimensional clinical aspect of PE.[24] This also can justify the high prevalence PE found in our survey.

Some limitations must be reported. A very young male population can lead to a participation bias, introducing the potential of overestimating their sexual performance or under-reporting some sexual complaints. As in all cross-sectional surveys, the causal direction of many questions is not clear. Furthermore, the prevalence of sexual dysfunction is estimated through the results obtained from the questionnaires and not clinically confirmed, which can raise questions as to their accuracy.

CONCLUSION

The quality of sexual life of men in adulthood is maintained at a satisfactory level even for older groups in this particular Amazonian population. This is probably because of specific lifestyle habits and environmental agents. Sexual domains such as desire, partner satisfaction, and quality of erection are related to the correlation between quality of sexual life and aging. However, the prevalence of PE seems to be slightly higher than in other parts of the world. Prospective and longitudinal data are needed to better understand these positive factors hidden in the Amazon Rainforest.

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Category 3

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