

Controversies in Sexual Medicine

Is Sex Just Fun? How Sexual Activity Improves Health

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ABSTRACT

Introduction. With nonscientific, religious, or magic arguments, sexual activity has been regarded in the past as dangerous to health. This opinion is now rejected, and intercourse is generally considered healthy. However, while some aspects of the equation “more sex equals more health” have been demonstrated, others still need robust data for confirmation.

Methods. Four scientists (an endocrinologist, a psychologist, a gynecologist, and a urologist) with expertise in the area of sexual medicine were asked to contribute with their opinions.

Main Outcome Measure. Expert opinion supported by currently available literature.

Results. Expert 1, who is *Controversy's* section editor, demonstrates that sexual activity stimulates testosterone production. He infers that this physiological stimulus to androgenic production is one of the reasons why sexual activity improves general health. He is partially supported by the psychological findings in the couple having sex dissected by expert 2 and by the experimental evidences discussed by expert 3, who found that general benefits of sexual activity are not just for men. Expert 4 critically discusses contrasting findings so far published on the relationship between sexual activity and prostate cancer. He, in general agreement with the remainder of the faculty, stresses the need for more research on this entire topic.

Conclusion. Readers of *The Journal of Sexual Medicine* will judge if safe, satisfactory, and frequent sexual activity can be prescribed as a medicine in order to improve both general and sexual health of individuals and of the couples. **Jannini EA, Fisher WA, Bitzer J, and McMahon CG. Is sex just fun? How sexual activity improves health. J Sex Med 2009;6:2640–2648.**

Key Words. Sexual Activity; Testosterone; Estrogen; Prostate Cancer; Depression

Is sex just fun or is it also healthy? Taoism emphasizes the need for self-control and moderation. Men are encouraged to control ejaculation to preserve this vital energy (*yang*), but women are encouraged to reach orgasm without restriction [1]. Although several other cultures and religions are traditionally convinced that the pleasure of sexual intercourse may be secured at the cost of vigor and well-being (if not at the price of eternal salvation), in preparing this new *Controversy*, I

found an unusual difficulty: to find scientists able to write against the assumption that sex is healthy and efficacious in improving both sexual and general health. In fact, modern sexual medicine considers almost universally that sexual activity is healthy. For this reason, *The JSM's* reader may find this *Controversy* with several pros and few cons.

My duty here, in order to introduce the reviews of a distinguished faculty composed of a

psychologist, Dr. William A. Fisher; a gynecologist, Dr. Johannes Bitzer; and an internist, Dr. Chris G McMahon, is to give the perspective of the endocrinologist, demonstrating that sexual activity physiologically stimulates the hypothalamus–pituitary–gonadal axis, and thus the endocrine health.

A possible model to study the effect of sexual activity on hormone production is the man with erectile dysfunction (ED) before and after treatment (i.e., before and after resumption of sexual activity). We have demonstrated in several articles that eugonadal men suffering from ED, irrespective of its etiology, have significantly lower androgen levels than normal controls, although still in the normal range [2–4]. We hypothesized that this is because of reduced luteinizing hormone (LH) bioactivity, a marker of impaired gonadotropin-releasing hormone (GnRH) pulsatile secretion [2,4]. All successful therapies, such as psychological (behavioral therapy), pharmacological (prostaglandin, sildenafil, tadalafil), and mechanical (penile prostheses, surgery, vacuum device) therapies are able to restore LH bioactivity and consequently testosterone (T) levels [3–5].

The psychological stress associated with long-term ED (i.e., enduring lack of sexual activity) may cause a hypothalamic disturbance of the GnRH pulse generator, which in turn causes the pituitary gland to secrete LH molecules with reduced bioactivity [6]. The lower biological activity of LH may be the biochemical reason for lower T production by Leydig cells. This may represent an adaptive mechanism. As demonstrated for the physiological reduction of many metabolic functions during forced starvation, the impossibility of regular sexual activity because of ED, or other internal or external factors, may reset the hypothalamic pulse generator to a lower activity, finally leading to a reduced hormonal stimulation of sexual drive.

Although some reports have not found a relationship between T levels and ED prevalence and severity [7], the direct correlation of serum T and self-reported sexual activity has been reported in many articles. Indeed, this idea was formulated more than 30 years ago when, in an article published in the journal *Nature*, it was found that androgen-dependent beard growth is a direct function of sexual activity [8]. In fact, the short-term exposure of men to women provokes tempo-

rary T concentration increases in both animals [9] and humans [10]. In healthy young men, peaks in salivary T levels coincided with periods of intense sexual activity [11]. Penile and systemic T significantly increases during excitation and erection in both normal [12–14] and ED subjects [15]. In 213 men with various degrees of ED, free T levels were significantly correlated with erectile function and, interestingly, with orgasmic function [16]. Men with coronary artery disease, a condition in which sexual activity is impaired, rare, or absent, have significantly lower levels of free T than age-matched healthy controls [17]. In either normotensive or hypertensive men, a positive correlation has been demonstrated between T levels and sexual activity [18].

All these observations demonstrate that sexual activity per se can affect T levels. Reduced T levels characterize the loss of sexual activity of ED patients, while androgen levels rise when sexual activity is started anew—no matter what the cause of the erectile impairment or how it was treated. For this reason, we can hypothesize that sexual activity is able to “feed” itself through activation of the hypothalamic–pituitary–testicular axis which results in increased T levels, increased readiness for the next sexual encounter, and for the reactivation of the endocrine axis itself.

More sex means more physiologically produced T. More T correlates with both psychological and general health. In fact, full, satisfactory sexual intercourse is not only associated with indices of ameliorated hormonal function, but also with the improvement of the corresponding physical and psychological parameters [19–21]. A possible answer to the methodological doubts exposed by Dr. Fisher in his piece on the correlation between sexual activity and mood is derived from a very recent article from Corona and coworkers which confirms that decreased intercourse frequency is bidirectionally coupled to poor psychorelational life: within a sample of 2,302 patients, a deterioration of the couple’s relationship is dramatically associated with impairment in sexual activities, which, in turn, can lead to an evident reduction in T levels [22]. Here, the piece of Dr. Bitzer, on the basis of the limited data so far published, suggests similar benefits, perhaps generated via other neuroendocrine patterns, can be hypothesized also in women.

Sexual health correlates so much with general health that the former can be considered an

efficient marker of the latter [23,24]. A famous study published in 1997 in the *British Medical Journal* [25] found, after a 10-year follow-up, that men who had fewer orgasms were twice as likely to die of any cause compared to those having two or more orgasms a week.

Less clear are the data correlating sexual activity and prostatic health, here reviewed by Dr. McMahon. The equation $\uparrow \text{sex} = \uparrow \text{T}$ apparently does not fit with the discussed equation $\uparrow \text{sex} = \downarrow$ prostate cancer. However, it can be argued that a neoplasia exquisitely T dependent [26] does not imply that the onset of prostate cancer is androgen dependent. Several studies demonstrated, in fact, that T supplementation in the hypogonadal patient does not increase cancer risk [27]. Furthermore, and more importantly, prostate cancer is an age-dependent disease [28]. This means that it is more likely to correlate with low sexual activity and low T than with the opposite.

In the light of this evidence, satisfactory and frequent sexual activity should be prescribed as a medicine to cure several intrapsychic (depression and other specific personality subtypes appearing to be significant risk factors for orgasmic infrequency [29]), relational (marital problems), and physical diseases in order to improve both general and sexual health.

Yes, despite some skepticism, I am definitively sure that safe, frequent, and satisfactory sexual

activity is not only fun, but also a powerful booster of health!

Emmanuele A. Jannini, MD

Opinion concerning health costs and health benefits of sexual activity has fluctuated wildly across the years, with conclusions on this score often resting more on antisex or pro-sex ideology than on dispassionate empirical science. Early in sexual history, Samuel-Auguste Tissot taught of the health disasters to be expected secondary to semen loss in excessive intercourse (Figure 1); Sylvester Graham warned of debilitating skin, lung, and brain diseases attendant upon sexual activity or upon mere contemplation of such activity; and John Harvey Kellogg cautioned about debilitating health sequelae of masturbation [30]. Modern opinion concerning sexual activity and health has shifted a full 180 degrees, with publications such as Roy Levin's [31] "Sexual activity, health, and well-being—the beneficial roles of coitus and masturbation" appearing in *Sexual and Relationship Therapy*, and Gallup et al.'s "Does semen have antidepressant properties?" in *Archives of Sexual Behavior* [32]. The point to be made concerning the ideological, as opposed to empirical, basis of opinion in this area—and opinion it remains—is that while the early sexual health dangers cited by Tissot, Graham, Kellogg, and others rested on no systematic empirical basis,

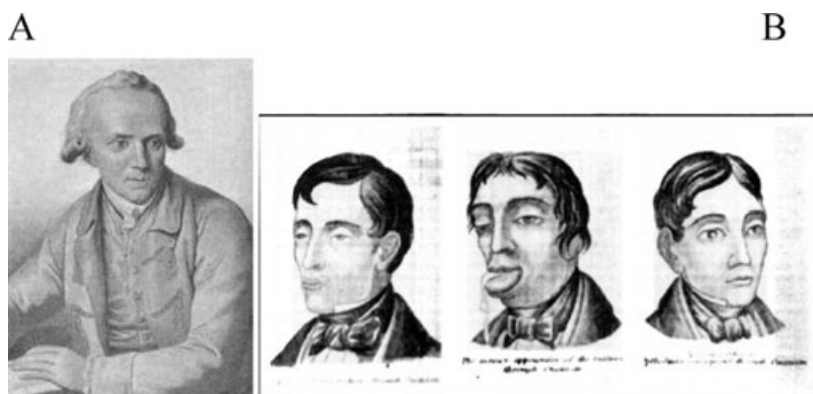


Figure 1 Simon-Auguste Tissot (1728–1797) (A), a notable 18th century physician, was a well-reputed Swiss Calvinist neurologist, physician, professor, and Vatican adviser. In 1760, he published *L'Onanisme*, his own comprehensive medical treatise on the purported ill-effects of masturbation. Tissot argued that semen was an "essential oil" and "stimulus" that, when lost from the body in great amounts, would cause "a perceptible reduction of strength, memory, and even reason; blurred vision, all the nervous disorders, all types of gout and rheumatism, weakening of the organs of generation, blood in the urine, disturbance of the appetite, headaches, and a great number of other disorders." (B) The Tissot's theory was very far from science and also ridiculously wrong in the term used: Onan (Genesis 38:6–10) was not a masturbator. He performed coitus interruptus, spilling his "seed" (semen) on the ground.

later claims for health benefits of sexual activity rest upon accurate, but selective appreciation of the data. Speculation concerning health benefits of sexual activity rests at least partially on pro-sex ideology and does not include comprehensive discussion of high rates of unplanned pregnancy; abortion; and repeat recourse to abortion, sexual violence, sexually transmitted infection prevalence, or the 33 million persons worldwide living with HIV/AIDS.

Cautiously then, where do we stand with respect to the proposition that sexual activity can cure depression? Historically, we know that an entire industry of vibrator technology flourished during the past two centuries to provide first physicians and then women themselves with the means to produce orgasm and treat, among other things, neurasthenia [33]. Anecdotally, we know at least one clinician who has apparently successfully used directed masturbation to reduce dysphoric mood in a depressed female patient. We note that Whipple and Komisaruk [34] reported analgesic effects of vaginal stimulation in women signaled by increased pain threshold. We know that Levin [31] and Gallup et al. [32] have presented evidence to suggest that deposition of semen in the female genital tract may have mood-enhancing and possibly antidepressant effects. We note that McVey [35] found that orgasmic consistency training for women who presented with hypoactive sexual desire disorder and evidence of depression showed reduced levels of depression following therapy. We note that Frohlich and Meston [20] found that women who showed depressive symptoms on the Beck depression inventory reported considerably more desire for masturbation and more actual masturbation than did nondepressed women. These investigators discussed the interesting possibility that autosexual activity represents a reliable primary reinforcer for depressed women in a situation in which other primary pleasures (such as food) may have lost their reinforcing value, and that masturbation may represent a self-administered mood enhancer used by depressed women to reduce dysphoric states. Finally, we note that Rosen et al. [36] report that pharmacotherapy of ED is associated with reduction in depression.

Nearly all existing research on the relationship of sexual activity and sexual health has been correlational in nature and has reported associations of sexual activity with a variety of health markers [31,32], or is otherwise circumstantial, incomplete,

or methodologically compromised. Experimental research in this area is fragmentary and has been confounded by substantial attrition problems [35]. Clarification of causal links between sexual activity and health end points consequently awaits the conduct of randomized controlled trials, and that is what we propose for the interested and adventurous researcher. Specifically, in one scenario, we envision the random assignment of healthy men and women of various ages (e.g., 20–25, 50–55, 70–75) to an intervention condition of directed sexual activity (say, masturbation twice per week, or intercourse with known deposition of semen in the vagina twice per week, or some such schedule) or to what might be termed a standard of (sexual) care condition. Comparison of mental health and interpersonal relationship end points (e.g., depression, relationship satisfaction), as well as biological markers (e.g., immune function) could permit assessment of the health promotion value of known types and frequencies of sexual activity. Similarly, in a second scenario, individuals facing specific health challenges (e.g., clinical depression, fibromyalgia) could be assigned to directed sexual activity vs. standard of care to determine whether known types and frequencies of sexual activity help alleviate the health challenge in question.

William A. Fisher, PhD

Frequency of sexual activity looks like a purely quantitative parameter which seems at a first glance unlikely to be directly related to more qualitative and global aspects of a sexual relationship. But, there are some characteristics of “sexual activity” which justify the assumption that the frequency of such an activity may have an impact on intimacy and sexual health.

An important first statement, however, is necessary. The impact of sexual activity (masturbation or intercourse) on health is determined by external and internal factors. External factors include possible risks (unwanted pregnancy, STI), and internal factors are self-determination, control, and satisfaction. Assuming that the sexual activity is satisfying and without health risk, it is accompanied by endocrine events, and physical and emotional reactions, which evidently may contribute to the women’s physical and mental health directly and indirectly, and may have also important aspects of prevention:

1. Vaginal lubrication, elasticity, and the trophism of the vagina are enhanced and maintained by

- sexual activity. This is an important part of sexual health-related prevention by reducing the risk of dyspareunia, chronic cystitis, etc. [21].
2. Pelvic floor structure and function are also positively influenced by sexual activity and can lead to positive feedback mechanisms by increasing pleasurable feeling. There is at the same time also a preventive effect on the development of prolapse and incontinence [37].
 3. The endocrine changes especially related to orgasm include oxytocin and dopamine secretions, and may thus change the internal neuroendocrine milieu involved in general affective states. This may even reduce the risk of depression [38].
 4. The emotional reactions include body-related feelings of excitement, pleasure, and relaxation, which in a medium- and long-term perspective may have a positive impact on body image and internal body representation, thus preventing body image disorders and functional somatic syndromes.

These effects of sexual activity are related to the individual woman and are independent of the type of activity (masturbation or intercourse with a partner). The question whether the frequency of sexual activity with the partner enhances or increases intimacy is a more complicated issue. First of all, the question arises: What is intimacy? Intimacy describes an emotional quality between individuals, characterized by feelings of closeness, safety, mutual understanding, profound acceptance, and unconditional positive attitude toward the other. Intimacy-like sexual activity is therefore also dependent on various external and internal variables.

There are several possible types of relationship between intimacy and sexual activity, and for each type one can find empirical confirmation:

1. Intimacy is a (pre)condition of sexual activity and not so much a consequence of it. Satisfaction with the emotional part of the relationship correlates with sexual functioning [39,40].
2. Intimacy and sexual activity are independent elements of a relationship. A high degree of intimacy may be present in the absence of sexual activity, and a high frequency of sexual activity may be observed in couples with a lack of intimacy [23].
3. Intimacy and sexual activity are interdependent elements which act on each other in mutual enhancement and a positive feedback manner [41,42].

Apart from empirical results, it seems that the third hypothesis corresponds best to the potential, which is inherent in sexual activity with a partner. If we assume again that the sexual encounter (mutual stimulation, intercourse, etc.) occurs between two partners without coercion on a self-determined basis, it is possible to delineate some typical characteristics of this encounter likely to increase intimacy: showing oneself naked to the partner is a special, exclusive behavior limited to persons considered to be trusted because it increases a person's vulnerability. The mutual exchange of giving and receiving sexual stimulation is a way of communication that offers access to intimate wishes and needs, and thus creates closeness and feelings of a shared exclusive experience. Opening up and letting oneself go are part of the sexual encounter and "disclose" deep-rooted feelings in the core of one's personality. These emotional effects may be enhanced by the earlier described hormonal processes especially the secretion of oxytocin.

In long-standing relationships, the shared sexual activity may additionally have a "symbolic" function, proving to the partners that their bodies and their souls continue communicating with each other.

Johannes Bitzer, MD

Although it is widely acknowledged that prostate cancer is a hormone-dependent malignancy, its causes remain poorly understood and sexual activity has been hypothesized to affect prostate carcinogenesis through numerous etiologic pathways.

It has been variously postulated that increased sexual activity is an indicator of higher androgenic activity [43] or represents an increased opportunity for exposure to sexually transmitted infectious agents [44], and is thus a marker for a high-risk population. However, no STI has been consistently implicated in prostate cancer development, and the infection theory is inconsistent with the lack of correlation between the incidence of prostate cancer and cancer of the cervix [45], and the increased mortality from prostate cancer in presumably celibate Roman Catholic priests [46]. Isaacs has suggested that infrequent ejaculation in otherwise normal men is a risk factor for prostate

cancer because of retained carcinogenic secretions in the prostatic acini [47]. And finally, the hypothesis that repression of sexuality is a risk factor for prostate cancer is derived from reports of higher levels of sexual desire coupled with deprived sexual activity [48] and greater interest in more sexual intercourse than actually experienced [49] among prostate cancer cases compared with controls.

A recent meta-analysis reported a somewhat inconsistent increased relative risk of prostate cancer for sexual activity at three times per week of 1.14 (95% confidence interval [CI], 0.98–1.31) during the third decade of life, 1.24 (95% CI, 1.05–1.46) during the fifth decade, and 0.68 (95% CI, 0.51–0.91) during the seventh decade [50]. Although ever-married men were suggested to be at a slightly increased risk (1.17, 0.98–1.40), the meta-analysis did not support associations with multiple marriages, age at first intercourse, or age at first marriage.

However, in the studies reviewed, the measurement of sexual activity was almost always restricted to episodes of sexual intercourse. If the relevant “exposure” from sexual activity is the amount of prostatic secretion, then this restriction may lead to substantial misclassification, especially in early adulthood and in later life, when solitary masturbation and not sexual intercourse may be the more frequent pathway to ejaculation. Giles et al. evaluated the association between prostate cancer risk and several aspects of sexual activity, with a special focus on total ejaculations rather than sexual intercourse alone. He reported no association of prostate cancer with the number of sexual partners, which argues against infection as a cause of prostate cancer, or with the maximum number of ejaculations in 24 hours [51]. However, there was a negative trend ($P < 0.01$) for the association between risk and number of ejaculations in the third decade. Men who averaged five or more ejaculations per week in their 20 seconds had an odds ratio (95% CI) of 0.66 (0.49–0.87) compared with those who ejaculated less often.

However, most of the epidemiological data on sexual activity and prostate cancer are derived from case-control studies which are methodologically biased because of retrospective data collection at the time of cancer diagnosis, which is totally reliant on potentially distorted patient recall [44,50,51].

Prospective data on self-reported sexual activity and prostate cancer are limited to three

studies [52–54]. Mills et al. and Severson et al. considered age at first marriage, marital status, and number of children as surrogate measures of sexual activity, and found no association between these factors and prostate cancer. Leitzmann et al., using follow-up data from the Health Professionals Follow-Up Study of 29,342 U.S. men aged 46–81 years, reported that ejaculation frequency was, in general, not related to increased risk of prostate cancer [54]. However, high ejaculation frequency was related to decreased risk of both total prostate cancer and organ-confined prostate cancer, but not advanced prostate cancer. The multivariate relative risks for men reporting 21 or more ejaculations per month compared with men reporting four to seven ejaculations per month at ages 20–29 years were 0.89 (95% CI, 0.73–1.10); ages 40–49 years, 0.68 (95% CI, 0.53–0.86); previous year, 0.49 (95% CI, 0.27–0.88); and averaged across a lifetime, 0.67 (95% CI, 0.51–0.89). The prospective study design which used total ejaculations as an end point, reported PSA tests and controlled for a wide range of medical, lifestyle, and dietary factors, suggests that reverse causation, differences in prostate cancer screening behavior, or confounding factors are unlikely to be entirely responsible for the observed results.

The null association or a possibly inverse association between high ejaculation frequency and prostate cancer is difficult to reconcile with the commonly proposed concept that androgenic stimulation is related both to enhanced libido and to increased risk of prostate cancer. It is possible that non-androgenic pathways may increase prostate cancer risk. Frequency of ejaculations may modulate prostate carcinogenesis by altering the composition of prostatic fluid. Frequent ejaculations may decrease the intraprostatic concentration of xenobiotic compounds and chemical carcinogens, which readily accumulate in prostatic fluid [55]. Frequent ejaculations may also reduce the development of intraluminal prostatic crystalloids, which have been associated with prostate cancer [56]. Because seminal plasma locally reduces host responsiveness, retained prostatic fluid may diminish intraprostatic immune surveillance against tumor cells [57]. Finally, frequent ejaculation may, by a release of psychological tension during the emission phase, lower central sympathetic nervous activity, reduce release of growth factors from α -1 adrenergic innervated

stromal cells, and inhibit prostate epithelial cell division [58].

In summary, the evidence supports the notion that ejaculation frequency is not related to increased risk of prostate cancer. However, high ejaculation frequency may possibly be associated with a lower risk of total and organ-confined prostate cancer. The frequency of ejaculation during adolescence has never been addressed and may be of etiologic significance with respect to prostate carcinogenesis, because prostate epithelial cell differentiation occurs at this critical period [59].

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