

# The Evolution of the Female Sexual Response Concept: Treatment Implications

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## SUMMARY

Sexual dysfunctions have been the most prevalent group of sexual disorders and include a large number of populations of both sexes. The research of sexual behavior and treatment of women with sexual distress arises many questions related to differences in sexual response of men and women. The conceptualization of this response in modern sexology has changed over time. The objective of our paper was to present the changes and evolution of the female's sexual response concept in a summarized and integrated way, to analyze the expanded and revised definitions of the female sexual response as well as implications and recommendations of new approaches to diagnostics and treatment according to the established changes. The lack of adequate empirical basis of the female sexual response model is a critical question in the literature dealing with this issue. Some articles report that linear models demonstrate more correctly and precisely the sexual response of women with normal sexual functions in relation to women with sexual dysfunction. Modification of this model later resulted in a circular model which more adequately presented the sexual response of women with sexual function disorder than of women with normal sexual function. The nonlinear model of female sexual response constructed by Basson incorporates the value of emotional intimacy, sexual stimulus and satisfaction with the relationship. Female functioning is significantly affected by multiple psychosocial factors such as satisfaction with the relationship, self-image, earlier negative sexual experience, etc. Newly revised, expanded definitions of female sexual dysfunction try to contribute to new knowledge about a highly contextual nature of woman's sexuality so as to enhance clinical treatment of dysfunctions. The definitions emphasize the evaluation of the context of women's problematic sexual experiences.

**Keywords:** female; sexual response; treatment; sexual behavior; sexual disorders

## INTRODUCTION

Sexual expression represents a part of human behavior range, which differs physiologically and psychologically among genders. The study of sexual behavior and male sexual dysfunction as well as the success of erectile dysfunction (ED) treatment has actuated the interest for better understanding of sexual problems in women as well as adjustment of treatment to newly developed knowledge.

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The paper was designed to present the changes and evolution of the female sexual response concept in a summarized and integrated way, to analyze the revised definitions of the woman's sexual functioning as well as the implications and recommendations of new approaches to diagnostics and treatment.

The lack of adequate empirical basis of female sexual response model is a critical question in the literature addressing this issue. Some articles [1] report that linear models demonstrate more correctly and precisely the sexual response of women with normal sexual functioning in relation to women with sexual dysfunction. Modification of this model

produced a circular model which more adequately presents the sexual response of women with sexual function disorder. Recent nonlinear model of female sexual response constructed by Basson [1, 2, 3] incorporates the value of emotional intimacy, sexual stimulus and satisfaction with the relationship.

## THE REVIEW OF PRESENT SEXUAL RESPONSE MODELS

### Linear model

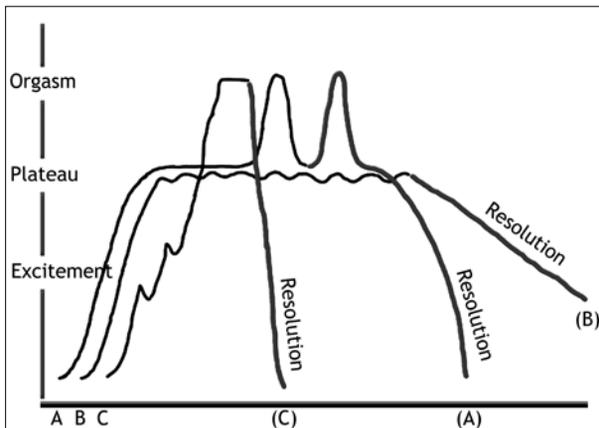
In 1966, Masters and Johnson [4] proposed a linear model of male and female sexual response composed of four stages. According to this model, sexual response begins with excitement phase (sexual arousal), proceeding to plateau phase, orgasm and finally resolution [4] (Figure 1).

Some time later, in 1979, Kaplan [5] added the concept of sexual desire to the model, condensing the response model into three phases: desire, arousal and orgasm. Over the past decade, the present framework of sexual response has been questioned, before all in the domain of female sexual response for a number of reasons:

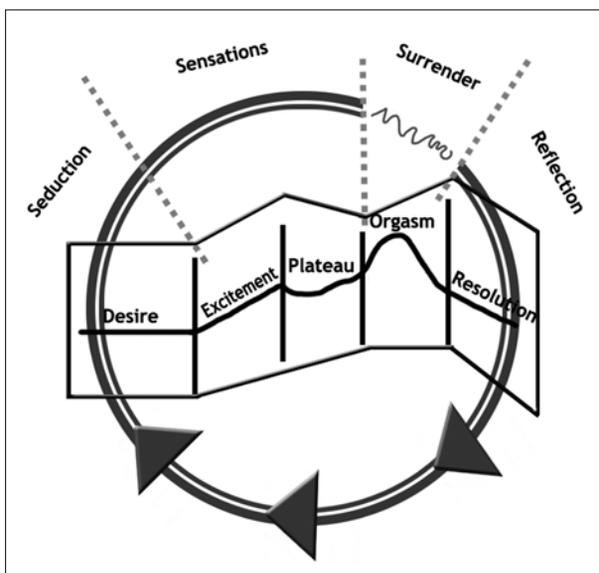
1) It is assumed that men and women have similar sexual response. If such an assumption was adopted as scientific truth, it might produce pathologization of normal sexual behavior of women [6].

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**Figure 1.** Female sexual response model developed by Masters and Johnson [4]



**Figure 2.** Circular model of female sexual response developed by Whipple and Brash-McGreer [9]

2) The clinical practice has demonstrated that many women do not move progressively and sequentially through the described phases of sexual response. According to Whipple [7], women may not have all phases of sexual response in their experience. For example, they may move from the excitement phase into the orgasmic and satisfaction phase without experiencing the sexual desire or they may experience sexual desire, excitement and satisfaction without orgasm.

One of contemporary researchers, Basson, asserts that much of female sexual desire is actually responsive rather than spontaneous per se. Basson [8] states that female sexual response is often a reaction to her partner's interest in sex rather than spontaneous guiding, i.e. controlling by her own libido.

3) Biological models by Masters and Johnson, and Kaplan's as well, have been, before all, criticized for not taking into account the non-biological experience such as pleasure and satisfaction into consideration [9], and additionally not placing the sexuality in the context of relationship [6].

**Circular model**

Upon recognition that all women do not fit into the linear model of sexual response, in 1977 Whipple and Brash-McGreer [9] suggested a circular model of the female sexual response. This concept is based on the Reed's model, consisting of four stages: seduction (encompassing desire), sensations (excitement and plateau), surrender (orgasm), and reflection (Figure 2) [9]. By making the Reed's model circular, Whipple and Brash-McGreer [9] demonstrate that pleasant and satisfying sexual experiences may have reinforcing effect on a woman, leading to the seduction phase of the next sexual experience. If, during reflection, the sexual experience did not provide pleasure and satisfaction, the woman might not have a desire to repeat the experience.

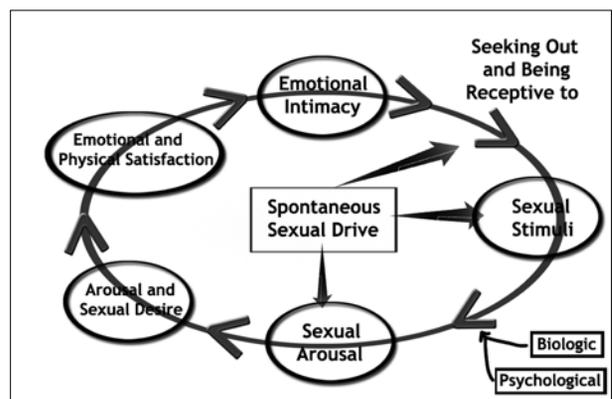
**Nonlinear model**

More recent nonlinear model of sexual response constructed by Basson [1, 2, 3, 8] incorporates the importance of emotional intimacy, sexual stimuli, and satisfaction with relationship (Figure 3).

This model acknowledges that female sexual functioning proceeds in a more complex manner than male sexual response. According to the model, female functioning is significantly affected by numerous psychosocial issues such as satisfaction with the relationship, self-image, previous negative sexual experiences, etc.

According to Basson, women have many reasons for engaging in sexual activity besides sexual hunger or drive, as the traditional model suggests. Although many women may experience spontaneous desire and interest in a new sexual relationship or after a long separation from a partner, in long-term relationships they do not frequently think of sex or have spontaneous hunger and need for sexual activity. Basson suggests that a desire for increased emotional closeness and intimacy or overture to a partner may predispose a woman to participate in sexual activity.

The Basson's model emphasizes that the goal of sexual activity for women is not necessarily orgasm but rather personal satisfaction, which can be manifested as physical



**Figure 3.** Nonlinear model of female sexual response developed by Basson [1]

satisfaction (orgasm) and/or emotional satisfaction (a feeling of intimacy and connection with a partner) [2, 3, 8].

## FEMALE SEXUAL FUNCTIONING: REVISED AND EXPANDED DEFINITIONS

Clinical experience and research in this field suggest the necessity for correction of previously accepted models of female sexual response, which leads to new conceptualization. The revised concept of female sexual response combines interpersonal, contextual, personal, psychological and biological factors. Such approach has resulted in recommendations for the revision of the definitions of female sexual disorders, which may be adequately incorporated in a new version of DSM (Diagnostic and Statistical Manual of Mental Disorders) classification of the American Psychiatric Association [10].

Past definitions contained in the DSM-IV classification of mental diseases were focused on the absence of sexual fantasies and sexual desire before experiencing the sexual activity and arousal, although the frequency of this type of desire may vary among women who have no sexual complaints. In addition, past definitions were focused on vaginal moisture and lubrication, i.e. the entities moderately correlating with subjective arousal and satisfaction.

Revised definitions take into account many other factors, primarily reflecting the significance of subjective sexual arousal. The conceptualization underlying the circular sexual response cycle where the stages overlap in a variable way may accelerate not only the evaluation but the treatment of dysfunction as well.

The studies on female sexual functioning in the last two decades have questioned former attitudes, definitions and diagnostic categories which are still found in 2000 DSM-IV TR [11, 12]. Previous definitions of female sexual dysfunctions were based on linear human sexual response model by Masters and Johnson [4] and subsequently revised by Kaplan [5]. This model assumes linear progression from the initial awakening of sexual desire to arousal focusing on the vaginal moisture and lubrication, up to orgasmic release and resolution. Resulting diagnostic categories such as disorder of decreased sexual desire, female sexual arousal disorder and orgasmic disorder reflect linear genital model of sexual functioning.

Recent reports of the International Committee, American Foundation for Urologic Disease, question the need for revision and expansion of the definitions of female sexual functioning [13]. The Committee relies on empirical and clinical studies as well as clinical experiences which were the basis for the Second International Consensus of Sexual Medicine [1] and Publications [1, 3].

### Normal female sexual functioning

Clinical and empirical studies on women who have no sexual complaints have come to the conclusion that sexual response differs from linear progression through

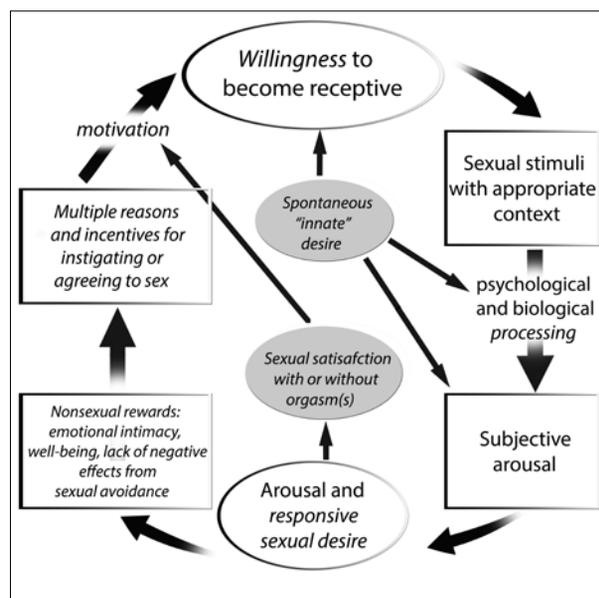


Figure 4. Female sex response cycle (modified from Basson) [43]

forementioned phases. Women describe an overlapping of sexual response phases in varying sequences that represent the “mixture” of psychological and corporeal response (Figure 4) [7, 8, 12]. Nevertheless, woman’s motivation to engage in sex is far more complex than a simple presence or absence of sexual desire (defined as contemplation, fantasies on sex and sexual desire with particular partner).

Figure 4 illustrates the sexual response cycle. It clearly shows the responsiveness of desire which is seen during sexual experience as well as variability of the initial (spontaneous) desire. The “initial” phase is characterized by sexual neutrality but with positive motivation. The reasons for the woman to begin or agree to have sex include desire to express her love, accept and share physical pleasure, feel emotional closeness, satisfy her partner and upgrade the sense of good feeling. The aforementioned reasons guide the woman to willingly find out and consciously focus on the sexual stimulus. Stimuli are processed psychically under the influence of biological and psychological factors, and the resulting condition is a subjective sexual excitement. Continuous stimulation provides sexual arousal and satisfaction that become more intensive, making them a trigger of desire. Sexual satisfaction, with or without orgasm, leads to the stimulation that is sufficiently continued and that the woman may remain focused, enjoying in sensation of sexual arousal and freed from negative outcome such as pain [2].

Recent study by Cain et al. [14] established the woman’s reasons for having sex, such as expression of love, pleasure, partner’s desire, tension-free feeling, or for not having sex, such as lack of interest, fatigue or physical problems – hers or partner’s, not having a partner. The authors’ findings as well as the results of other studies were compatible with sexual response presented in Figure 4. At the beginning of sexual experience, the woman need not have sexual desire per se. Her motivation to be sexual is complex and includes augmentation of emotional closeness with her partner (emotional intimacy) and frequently the increase

of her own good feeling and self-image (feeling of her own attractiveness, femininity, being accepted and appreciated, loved and/or desired, or diminishing of her own anxiety or feeling guilty for having sex so often) [15-19].

When the woman wants to be aroused and enjoys in sexual experience, she is focused on the sexual stimulation accomplished by her and her partner. If stimulation is desired and there is sufficient available time so that she could remain focused, her sexual arousal and pleasure becomes intensified. Naturally, the type of stimulation, required time and context (erotic and interpersonal) are highly individual. Positive emotional and physical outcomes will augment the resulting motivation.

Some women report on spontaneous desire (Figure 4) leading to excitement and higher enthusiasm to disclose or to be receptive to sexual stimulus. There is a broad spectrum of such type of desire among women, and it may be associated with menstrual cycle [20]; it grows with aging [21] and in all age periods it commonly increases with new relations [11, 19].

It is not clear how many women have a low sexual desire or even the lack of spontaneous desire, and how many of them experience a trigger of desire during sex activity [12, 22, 23]. Sexual fantasies could free the woman and accordingly she can stay focused on the sexual stimulus rather than on the indication of sexual desire.

Robust correlation between subjective arousal and genital congestion (erection), established in men, cannot be found in women [24, 25, 26]. Female sexual arousal is more strongly modulated by thoughts and emotions triggered by the state of sexual excitement [27]. Previous definitions of sexual arousal disorders were focused only on genital lubrication and/or moistening, having ignored numerous studies over the past twenty years which demonstrated that there was a modest correlation of genital enlargement and female subjective experience of arousal as a reaction to sexual stimulation.

## THE CAUSES OF FEMALE SEXUAL DYSFUNCTION

The model of the sexual response cycle (Figure 4) more clearly accentuates the significance of female ability to become subjectively aroused. Many psychological and biological factors may have negative effects on sexual arousal; interpersonal, contextual, personal and other.

### Interpersonal and contextual factors

A recent national study on sexual distress carried out on a sample of American heterosexual women [22, 23] showed that emotional relations with the partner during sexual activity and general emotional good condition were two most potent predictors of distress absence in sex. The women who ranked their mental condition as healthy (using the standard psychological instruments) reported a lesser degree of distress related to their sexual relations in comparison to women who evaluated their

mental health as poorer. Healthier women reported 59% lesser distress related to their sexual activities. The feeling of emotional closeness with their partner during sexual activity decreased from "mild distress" probability in 33% compared to "absence of distress" and "significant distress" in 43% of the time. In other words, the higher the degree of the emotional intimacy with her partner, the lesser the degree of distress. Other contextual factors reducing the arousal include safety considerations (risks of unwanted pregnancy and sexually transmitted diseases, emotional and physical security), lack of privacy, insufficiently erotic situations, and lack of time or extreme haste.

### Personal psychological factors

Female arousal is frequently influenced by nonsexual distractions of everyday activities, and sometimes by sexual distractions as well (e.g.: concern whether she will be sufficiently excited, achieve orgasm, and delayed or premature ejaculation of the male partner or lack of female orgasm) [28]. Empirical studies demonstrated a high correlation of women's complaints about sexual desires with low self-image, unstable temper and tendency to be worried and anxious (no criteria of clinical definitions of temper disorders) [29, 30].

Other inhibitory factors involved recollection of past negative sexual experiences, including those that were forced or abusive, and expectation of negative outcomes of sexual experiences (e.g., dyspareunia or the partner's sexual dysfunction) [31].

### Biological factors

Lately, biological and pathophysiological background of normal and disordered female sexual response has drawn the attention of many researchers. The majority of basic sciences and animal experiments in the respective field are far much broader than the framework of this paper, and therefore, only some significant results are presented. Certain studies were concentrated on attempts to accomplish a higher therapeutic efficiency and a higher degree of improvement, with the trend of avoiding drug side-effects on female sexuality, as in the case of antidepressants.

Sexual dysfunction is a relatively common side-effect during the use of antidepressants [32, 33]. Among treated women, much older, married women with a low to secondary-level education, and without full-time job were more prevalent, and they used concomitantly drugs of various types, had co-morbid conditions that could interfere with sexual functioning or the history of antidepressant-related sexual dysfunctions. In addition, they considered sexual functioning as irrelevant, resulting from earlier sexual experiences which provided little comfort and pleasure [34-37].

Current studies address the role of dopamine and other neurotransmitters, their effects on sex hormone receptors, as well as the impact of sex hormones on neurotransmitters. Animal experiments showed that estrogenized women changed their sexual behavior after the administration

of progesterone. The studies demonstrated that identical changes occurred after dopamine use or in the presence of a male [38, 39]. Intriguing is the study by Segraves et al. on 75 non-depressive premenopausal women with the diagnosis of hypoactive sexual desire disorder (according to the DSM-IV), who received bupropion (antidepressant - dopaminergic drug; the average dose of 389 mg/day) or placebo [40]. The subjects treated with this drug exhibited significant improvement such as a higher level of satisfaction, arousal and orgasm. It was noted that these changes were followed by increased sexual drive.

New biological studies have investigated the role of testosterone in sexual functioning. About a half of daily testosterone production in the woman originates from the ovaries. Some women with a sudden loss (reduction) of ovarian androgen production lose sexual arousal. Recently, it has been reported that the physiological testosterone supplementation in high doses (contrary to pharmacological evidence) leads to the increase of arousal and more intensive orgasmic experience, but not to more contemplation, fantasies or spontaneous wishes of sex [41].

To be reminded of animal models, and dopaminergic or testosterone supplementation may augment the level of arousal in some women, however, the same effect may be achieved by changing the environmental factors (a new partner) [38, 40, 41].

## DEFINITIONS AND PREVALENCE

Based on the latest work of the International Committee, American Urologic Foundation [2], the prevalence rates of recently defined categories was to a large extent unknown, since little attention has been paid to subjective experience of arousal. They used to be encompassed by the older term "hypoactive sexual desire disorder", described by women as the lack of spontaneous or initial desire, the deficit of which was not included in the new definition of female sexual dysfunction. It is estimated that the prevalence of hypoactive sexual desire among women of 30%-40% could be incorrect. If the lack of spontaneous or initial desire was widely accepted as non-disorder, the number of women diagnosed with sexual disorder would be significantly lower as expected.

The official data on female orgasmic disorder are not reliable, considering that this disorder is frequently associated with arousal disorder; the DSM-IV-TR 2000 [10] postulates that female non-orgasmic level must be high so as to fit in the definition of female orgasmic disorder.

Data on the prevalence of dyspareunia or vaginism differ significantly from one study to another. A total cumulative incidence rate of the subjects reporting the inability of having sex due to pain rated 10%.

The publications related to the prevalence of sexual arousal and internet researches have appeared only recently.

## DIAGNOSIS AND TREATMENT

Considering that female sexual function is a result of an actual psychosocial and interpersonal context, which is determined to some extent by female sexual medical history and medicaments, the International Committee [2] recommended the evaluation of three factors that may effect sexual dysfunction: previous psycho-sexual development, actual life context and medical factors (including co-morbid conditions, drugs and earlier surgical interventions).

Essentially, sexual dysfunction can be a symptom of some other disorder. It is important to avoid pathologization of women by diagnosing the sexual disorder based on normal response, such as fatigue or side-effects of drugs. At the same time, it is vital to avoid the implication that dysfunction would be absent or discredited, if the cause was not primarily identified in the patient.

Upon meticulous collection of data from the patient's history, the therapist helps the female patient to construct her cycle of sexual response, which is then followed by the identification of the scope of the problems [13, 42]. Such approach provides the insight and direction of many changes required from a woman and her partner. For example, the partner's premature ejaculation can involve the subject of treatment, improvement of sexual context, treatment of depression, prescription of local estrogen, advice of the couple to undergo marriage therapy, and advice of one or both partners for referral to psychotherapy that will be focused on the samples of reflection and behavior resulting from probable traumas or negative experiences from childhood or any later period of life.

## CONCLUSION

Acceptance of an evidence-based conceptualization of women's sexual response combining interpersonal, contextual, personal psychological and biological factors has led to recently published recommendations for the revision of the definitions of women's sexual disorders published in the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-IV-TR). It is evidence-based data that there is only a modest correlation between subjective experience of sexual arousal and objective measures of increased genital vasocongestion.

Newly revised, expanded definitions of female sexual dysfunctions strive to confirm and lead to new knowledge of the highly contextual nature of female sexuality [43, 44]. They emphasize the value of assessing the context of women's problematic sexual experiences and support the clinical treatment of dysfunctions. Definitions of sexual dysfunction continue to reflect the phases of sexual response and clarify the tendency towards overlapping of phases.

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## Еволуција концепта женског сексуалног одговора – импликације за лечење

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### КРАТАК САДРЖАЈ

Сексуалне дисфункције су најпревалентнија група сексуалних поремећаја које се јављају код великог броја особа оба пола. Истраживања сексуалног понашања жена, као и лечење жена са сексуалним дистресом, покрећу бројна питања у вези с разликама у сексуалном одговору мушкараца и жена. Концептуализација овог одговора у савременој сексологији временом се мењала. Циљ овог рада је да промене и еволуцију концепта женског сексуалног одговора прикаже на сажет, интегративан начин, потом да прикаже и анализира препоручене проширене и ревидиране дефиниције женског сексуалног функционисања, као и импликације и препоруке нових приступа дијагностици и лечењу у складу с утврђеним променама. Недостатак одговарајуће емпиријске основе модела женског сексуалног одговора је критично питање у литератури која се бави овом тематиком. Поједини радови указују на то да линеарни модел много тачније и прецизније приказује сексуални одговор жена с нормалним сексуалним функционисањем у односу на жене

с поремећајем сексуалног функционисања. Модификацијом овог модела накнадно је настао циркуларни модел, који је био прецизнији у представљању сексуалног одговора жена с поремећајем сексуалног функционисања, него жена с нормалним сексуалним функционисањем. Нелинеарни модел женског сексуалног одговора које је конструисао Басон (*Basson*) инкорпорира значај емоционалне интимности, сексуалног стимулуса и задовољства партнерским односом. Функционисање жена је значајно под утицајем бројних психосоцијалних фактора, као што су задовољство партнерским односом, слика о себи, претходна негативна сексуална искуства и сл. Нове ревидиране и проширене дефиниције сексуалних дисфункција код жена покушавају да допринесу новим сазнањима о контекстуалној природи женске сексуалности, као и да побољшају ефикасност клиничког лечења дисфункција. Дефиниције наглашавају значај евалуације контекста проблематичних женских сексуалних искустава.

**Кључне речи:** жене; сексуални одговор; лечење; сексуално понашање, сексуалне дисфункције

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