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Exploring the Psychosocial Predictors of Male Sexual Desire

Testing an Integrated Model

Candidate PhD Student

Filippo M. Nimbi

Department of Dynamic and Clinical Psychology, Sapienza University of Rome

Tutor

Chiara Simonelli

Associate Professor

Dept. of Dynamic and Clinical Psychology

Sapienza University of Rome

Co-Tutor

Roberto Baiocco

Associate Professor

Dept. of Process Development and Socialization Psychology

Sapienza University of Rome

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Introduction

There are countless books and papers on sexuality and an endless fascination with the subject. Varieties and vagaries of "sexual desires" have long been documented, but there has been little engagement with cutting-edge scientific research to uncover the biological, psychological and social bases of sexual drive. Historically, sexual desire had more to do with romantic love than with science, and was far from being scientifically understood until Hellen Singer Kaplan (1974) described it as the first phase of sexual response. From that point on, desire began to be under the attention of many researchers, focusing more in women than in men. Today we know much more about desire, but a lot more needs to be done to understand the normal process of sexual motivation and the clinical counterparts. What is sure is that male sexuality is considerably more complex than previously thought: a hard and rigid erection is not enough to explain men functioning. This is where the idea of this project comes from.

When we talk about male sexual desire, we usually put together an enormous range of different experiences, varying from the all-consuming, through indifference, to aversion and from cases where romantic bonding is a necessary condition for desire to the extremes of callous violence. The level of sexual desire is the outcome perceived, but behind it there is a lively interplay of many forces: genetic and physiological differences, pleasure, motivation, thoughts, fantasies, attachment, drugs, anger, aggression, fear, disgust, culture, and family messages on sex are just some of these... Given the variety of contributory effects, it is not surprising that there is such a range of different desires both in terms of intensity and their target of attraction.

Our hope is that the project presented here will help to better understand part of these differences in terms of contributory factors to increase or lower the levels of sexual desire perceived in men. It is our firm belief that a wide-ranging study on psychosocial determinants of sexual desire will be of

significant help not only for research, but mainly for clinical practice, suggesting the best areas to explore and to deal with in sexual therapy.

The project is presented in four chapters, trying to describe all the steps and the thoughts made by the authors during the work. The *first chapter* is focused on giving a critical overview of the literature about the current understanding of sexual desire, concentrating on gender peculiarities and biopsychosocial variables associated with the interest phase of sexual response. Moreover, the main aims and the general structure of the project are presented in order to better focus on the specific studies in the following chapters.

The *second chapter* presents the pilot study of the psychosocial predictors of sexual desire. The research process and the selection of the sample are described. The preliminary data about almost 300 men are reported and debated in order to improve procedures and methods in the main part of the project.

The *third chapter* describes the full-scale study. Following the line of the pilot, a wider sample has been reached in this phase (450 men) and data are better described and discussed. The research of the main predictors is essential for the theorization of a model explaining how the factors highlighted interplay with each other, affecting the level of sexual desire.

The *fourth chapter* represents the core of the project. The results from the previous studies are summarized in two models, which are tested and compared. After choosing the best model able to fit with our data, the theoretical implications and the clinical applications are discussed in order to present a new useful tool to practitioners dealing with sexual desire problems in men.

1. What do we know about sexual desire?

1.1. Definitions of sexual desire

The study of sexual desire arises within a historical, cultural and religious context, which powerfully influences how it is interpreted (Hawkes, 2004). There is no univocal way to describe sexual desire, as far as it is more complex than any other sexual process; it has unique subjective aspects and reflects cultural and historical changes, making any understanding extremely challenging. Moreover, expressions of desire are extremely different not only between individuals, but even within the same person, from temporary fluctuations to broad changes in distinct phases of life. The enormous variation in the reactivity of human sexual desire is a feature that must be accommodated by any attempt to explain desire's foundation (Toates, 2014).

Sexual desire is frequently referred to as the subjective psychological status to initiate and maintain the human sexual behaviour, triggered by internal and/or external stimuli (Lewis *et al.*, 2010; Mark *et al*., 2014). Primarily, it was conceptualized by Kaplan (1974; 1979) as the initial phase of sexual response, preceding arousal, orgasm and resolution. Basson (2002) defined it as an experience of sexual thoughts and fantasies joined with the will to begin a sexual activity. Levine (1987; 2002; 2003) focused on the "motivation or inclination to be sexual" and highlighted three biopsychosocial components:

- *Drive*, that can be described as a biological aspect including anatomy and physiology of the neuroendocrine system;
- *Motivation*, the psychological part that includes mental states, relational issues, and social context;
- *Wish*, the cultural element considering ideals, values, and rules regarding the expression of sexuality.

DeLamater *et al*. (2017) showed how the use of sexual-related terms is subjective and culture-dependent. They reported that the majority of people interviewed characterized "sexual interest" as a cognitive phenomenon and a situational response to a specific person; "sexual desire" as a situational person-specific phenomenon, with both cognitive and physical experiences; and "sexual arousal" as a physical phenomenon occurring in response to physical or visual stimulation and not related to a specific person.

Stoléru (2006) highlighted the cognitive and emotional components of sexual desire, stating that it involves a mental representation of a goal regarding sexual pleasure, which is emotionally charged. Following this line, some authors (Janssen *et al*., 2008; Prause *et al*., 2008) put desire in close connection with arousal, describing drive as the predisposition to subjectively respond to sexual stimuli with feelings of sexual excitement. Much processing of information occurs at an unconscious level, establishing the basis on which the conscious experience of desire is built. Erotic imagery and the feeling of arousal represent the outcome of such processing available to consciousness.

Regarding some common manifestations of sexual desire, Levine suggested to focus on (2010):

- masturbation;
- attempts to initiate sexual behaviour with a partner or receptivity to partner initiation;
- "erotic fantasies" – day- or night-time thoughts about sexual interaction;
- sexual attractions and responses to others;
- spontaneous genital sensations of arousal accompanying erotic thoughts, identified as "horniness" or "randiness" by men, and as sexual drive by clinicians.

However, these definitions are far from describing such a complex phenomenon. The knowledge we have today about sexual desire is still partial and vague, with no general agreement between scientists and clinicians.

1.2. Gender differences and couple-discrepancy in sexual desire

A principal area of interest in sexology is represented by the study of differences between sexes in terms of, to give some examples, desire for sexual variety, casual and indiscriminate sexual behaviour, and pornography use (Toates, 2014). In general, a leading gender stereotype states that men are more interested in sex than women purely for physical reasons. Evolutionary socio-biologists suggested that this difference in sexual strategy is biologically determined and reflects an optimal "spreading genes strategy". In contrast with this position, many sociologists and anthropologists argue that the variance is mostly culturally determined (Wu *et al*., 2016). The nature-nurture debate regarding sexual interest has been long-standing without resolution (Baldwin & Baldwin, 1997; Hakim, 2015). Nowadays, it is slowly moving towards a holistic understanding of the sexual function in men and women.

A cultural assumption that holds true in many Western and Eastern cultures is that men are always interested in and ready to have sex. According to the Baumeister, Catanese and Vohs meta-analysis (2001), men typically report a higher sexual drive, a greater number of sexual thoughts and fantasies, an increased desired frequency of sex and a higher desired number of sexual partners than women. This idea of men "full of sexual desire" contributed to developing clinical trials exploring the existence and describing the characteristics of men with low sexual desire despite having no erectile dysfunction or ejaculation problems, no depression and normal serum testosterone. (Rubio-Aurioles, 2015). A cross-cultural study on the general population in 29 countries showed that gender differences in desire and sexual interest are universal, but the gap between men and women is larger in male-dominated cultures than in liberal Western societies (Hakim, 2015).

More than between genders, recent studies are now focusing on the variance within sexes and the differences inside the dyads. Meston & Buss (2007) identified four main factors of sexual motivation (physical reasons, goal attainment, emotional and insecurity explanations). Men were more used to report physical reasons, goal attainment, and insecurity motives than women, even if the individual differences in expressed reasons for having sex were coherently linked with personality traits and

with peculiar sexual strategies. There are also significant gender differences in the object of sexual desire (Mark *et al*., 2014): men are significantly more likely to endorse desire for sexual release, orgasm, and pleasing their partner than women, who usually are more used to having a desire for intimacy, emotional closeness, love, and feeling sexually desirable.

The "couple discrepancy" is one of the crucial issues that contributes to increasing the relational distress inside the dyad facing sexual desire problems. Sexual desire discrepancy can be defined as the point in which two partners in an intimate relationship have considerable different levels of desire or frequency of sexual activity (Zilbergeld & Ellison, 1980). Desire discrepancy can arise for a variety of reasons, including lifestyle patterns (e.g., preferred time for sleeping, work schedule conflicts, medical issues, hormonal levels or relationship factors) and represent the most common sexual complaint for women (Ellison, 2001; West *et al*., 2008). In the context of a relationship, the individual who reports lower sexual desire (compared to the partner) is often led to believe that he/she is the one who has a problem. This happens when he/she is using his/her partner's level of sexual desire as the benchmark for what should be "normal" (Hurlbert *et al*., 2000). Sexual desire discrepancy has received relatively little empirical attention in the context of dyads, despite research showing that large discrepancies in desire are usually associated with lower satisfaction outcomes (Mark, 2012). Mark & Murray (2012) also found that desire discrepancy negatively impacted sexual and relationship satisfaction in a sample of heterosexual couples, after controlling age and other relationship variables.

Other studies have found discrepancy significantly related to sexual and relationship satisfaction (Willoughby & Vitas, 2012; Willoughby *et al*., 2014). Higher desire discrepancy scores significantly predicted men's (but not women's) lower relationship satisfaction. However, these studies did not consider individual levels of sexual desire relative to couple discrepancy in predicting satisfaction. Solitary sexual desire is usually significantly higher in men than women and it is associated, in women only, with positive implicit sexual attitudes, suggesting that solitary sexual desire may fulfil specific functions in men and women. Even if there are gender peculiarities, sexual satisfaction depends on

the combination of explicit and implicit sexual attitudes in both men and women (Dosch *et al*., 2016a). Higher perceived (but not actual) desire discrepancy is associated with lower sexual satisfaction in men and women (Sutherland *et al*., 2015).

1.3. Sexual desire among the models of sexual response and the classifications

Sexual desire has been debated for years in scientific literature, especially regarding women (Sand & Fisher, 2007; Segraves *et al*., 2007; Giraldi *et al*., 2015). From the first inclusion of desire phase on DSM III (American Psychiatric Association, 1980) based on Kaplan's model (1974; 1979), the following statements had different paths for the two genders. The debate in scientific literature for female desire (Basson *et al*., 2003; Sand & Fisher, 2007; Meana, 2010; Segraves *et al*., 2007) led to the "incentive-motivation model" (Both *et al*., 2007; Laan & Both, 2008), in which sexual desire results from the awareness of sexual arousal or excitement, that has already occurred in response to sexual stimuli, even when women are unaware of encountering them. Sexual desire may feel spontaneous but sexual stimuli are often processed unconsciously before the conscious arising of the feeling. It follows that sexual desire and arousal in women are now accepted by DSM-5 as a unique phase of sexual response (Spiering *et al*., 2006; Brotto, 2010; Tripodi *et al*., 2015), even if some authors strongly disagree with this view, keeping separate desire and arousal (Sarin *et al*., 2013; 2014; Sungur & Gunduz, 2014). The members of the Fourth International Consultation on Sexual Medicine (ICSM) (McCabe *et al*., 2016) advocate that sexual desire dysfunctions should be kept as a separate entity from female sexual arousal dysfunctions. Further research is necessary to determine the extent to which these two dysfunctions are separate entities, even if data on incidence, prevalence and risk factors for sexual dysfunctions clearly support the separation of these two conditions.

On the male side, since the beginning, most of the attention was paid to the arousal phase instead of the desire phase. In 2004, Lue *et al*. in the "International Manual of Sexual Medicine" described the problems of sexual desire in a few lines highlighting the absence of psychological treatment

protocols for sexual desire claims and focusing on the erection process. For years, the only medical treatment available for low sexual desire was the use of Testosterone, which has been shown to be effective only in the hypogonadism conditions. In recent years, the DSM-5 (American Psychiatric Association, 2013) has clearly distinguished between desire and excitement thanks to the erection phenomenon. Some research, however, reported that both patients and clinicians still got confused in the evaluation of desire and subjective arousal (Althof *et al*., 2011; Bancroft & Graham, 2011; Mitchell *et al*., 2014; Corona *et al*., 2015; DeLamater *et al*., 2017). The classification of male sexual dysfunctions in the DSM-5 is still based on Kaplan's linear model (1974; 1979), in which desire is described as a distinct phase preceding arousal and activating a sexual "chain reaction" response. Criticisms of this model identify that it does not contemplate that male desire can be responsive and influenced by psychosocial factors such as past sexual experiences (Basson *et al*., 2003; Brotto, 2010; Corona *et al*., 2013; Štulhofer *et al*., 2013; Giraldi *et al*., 2015). The Fourth ICSM (McCabe *et al*., 2016) strongly emphasized that Hypoactive Sexual Desire Disorder (HSDD) should be kept separate from arousal dysfunctions. Moreover, considering expert opinions and clinical principles, ICSM gave a unisex definition of Sexual Interest-Desire Disorder as "persistent or recurrent deficiency or absence of sexual or erotic thoughts or fantasies and desire for sexual activity", showing how it is similar in men and women, with some etiologic and prevalence peculiarities. Future research should focus on supporting this definition and elucidating aetiologies and prevalence as well as other characteristics.

Regarding the epidemiology of desire problems, the prevalence of low sexual desire in women (with and without associated distress), as defined by DSM-IV or ICD-10, may vary markedly (from 10% to 40%; Bitzer *et al*., 2013) in relation to age, cultural setting, duration of symptoms, and presence of distress. When distress about sexual functioning is required, prevalence estimates are markedly lower in women: some older people report less distress about low sexual desire than younger ones, although sexual desire may decrease with age (American Psychiatric Association, 2013). The prevalence of male HSDD varies depending on country of origin and method of assessment. Approximately 6% of younger men (aged 18-24) and 41% of older men (aged 66-74)

have problems with sexual desire. However, a persistent lack of interest in sex, lasting six months or more, affects only a small proportion of men aged 16-44 (1.8%) (Brotto, 2010; American Psychiatric Association, 2013). What is more common in men is the case of Hypersexuality (extremely frequent or suddenly increased level of libido creating distress), which is still under debate and was proposed for the DSM-V, but not inserted for lack of empirical studies (Tripodi *et al*., 2015). A recent population study has provided an evaluation of the occurrence of ''out of control sexual experiences'', and its relationship to a range of sexual behaviours in a representative sample, reporting that nearly 13% of men and 7% of women had sexual fantasies, urges or behaviours that they considered as out of control during the last year (Skegg *et al*., 2010).

Since the coexistence of desire problems with other sexual dysfunctions is rather common, the Standard Operating Procedure (SOP) proposed to use the term "Low Sexual Desire/Interest (LSD/I)" as a general definition for the symptom/syndrome that might be caused by medical conditions such as depression, endocrine abnormalities, relationship factors, medications or drugs and to reserve the DSM-IV-TR disorder denominated HSDD in men, for the cases where other etiological factors have been appropriately excluded (Rubio-Aurioles & Bivalacqua, 2013).

1.4. Biopsychosocial determinants of male sexual desire

Understanding sexual desire and behaviour requires a new organizing framework, one that does justice to the influences of both biology and culture and which can mesh with evolutionary psychology. The framework needs to take into account the fact that social and biological factors are not in competition in terms of their relative weight in the control of desire. Rather it needs to show how biological and social contributions are interwoven. It must be able to accommodate the fact that different influences arising from culture can be assimilated by the brain and contribute to differences in sexual desire. In this multifaceted scenario, clinicians and researchers have recognised the Biopsychosocial (BPS) model as the leading approach for clinical psychology and sexual medicine

(Berry & Berry, 2013; Kirana *et al*., 2013; Reisman *et al*., 2015). Sexuality's nature is integrated: it involves bodies, feelings, emotions, beliefs, cultures, thoughts, past experiences and new perspectives. Moreover, the ICSM (Lue *et al*., 2004; Montorsi *et al*., 2010; McCabe *et al*., 2016) outlined the BPS as the key approach in sexual medicine. It has been noted, however, that the clinical implementation of BPS practice is quite challenging (Simonelli *et al*., 2010; Goldstein, 2012). BPS requires multidisciplinary cooperation and flexibility, elements that still cannot be taken for granted.

The BPS model recognizes a complex interaction between internal cognitive processes, neurophysiological mechanisms, and affective components in sexual desire (Trudel *et al*., 2001; Corona *et al*., 2013). Fewer studies have attempted to describe these relations with rudimentary models (Carvalho & Nobre, 2011a; 2011b; McCabe & Connaughton, 2014; Dosch *et al*., 2016a; 2016b). The use of different methodologies and tools has made it even harder to describe sexual desire in men. For example, in line with the latest diagnostic criteria, some studies included the assessment of perceived distress (Mercer *et al*., 2003; Laumann *et al*., 2005; Træen *et al*., 2007; Træen & Stigum, 2010; Hendrickx *et al*., 2013; 2014; 2016; Carvalheira *et al*., 2014). Other studies, instead, took into account only the level of desire perceived in various time ranges (from 1 to 24 months) (Laumann *et al*., 1999; Wagnern *et al*., 2000; Najman *et al*., 2005; Carvalho & Nobre, 2011a; 2011b; Peixoto & Nobre, 2014).

However, little is known about why individuals vary in their levels of sexual desire. The literature lacks studies of male sexual desire, most of which have focused on HSDD, mainly in coupled heterosexual men (Hyde, 2005; 2007; Janssen *et al*., 2008; McCarthy & McDonald, 2009; Brotto, 2010; Janssen, 2011; Štulhofer *et al*., 2013). Fewer studies have investigated high levels of sexual desire and different populations (Kafka, 2010; Winters *et al*., 2010; Carvalheira *et al*., 2014; Carvalho *et al*., 2015). However, the current understanding of the specific factors influencing the nature of sexual desire in men is incomplete and remains to be explored. Following, it is presented an attempt to summarize the most influential research on this issue, dividing the factors into biological, psychological, sexual functioning, relational and cultural. This division is sometimes mechanic and

arbitrary, as some factors, in line with the BPS understanding of health, result from more than one category (e.g., Quality of Life is an expression of both physical and psychosocial wellness).

1.4.1. Biological factors

Early studies tried to identify some physiological predictors of sex drive on hormonal levels (Ansong & Punwaney, 1999; McNicholas *et al*., 2003; Baumeister, 2004; Corona *et al*., 2004; 2009; 2015; Bancroft, 2005; Basson & Schultz, 2007; Richardson *et al*., 2007; Gades *et al*., 2008; Emmelot-Vonk *et al*., 2009). Androgens such as testosterone are essential for male sexual desire: it has been shown that a minimum level of androgens is required for being able to experience sexual desire; however, this relationship is not completely linear as the higher level of free androgens in the blood does not directly correlate with higher levels of sexual desire (Rubio-Aurioles & Bivalacqua, 2013). Testosterone was investigated revealing a direct effect on sexual interest only in hypogonadism (Gades *et al*., 2008; Corona *et al*., 2015).

Across human societies and many animals, males showed greater interest in uncommitted sex than females. In line with that, Testosterone was shown to increase the desire for uncommitted sex and hence for greater numbers of sexual partners. The satisfaction of these desires usually lowers the levels of free testosterone in the blood after the intercourse, but not the desire perceived (Puts *et al*., 2015). Recent guidelines (Corona *et al*., 2016) indicated that several hormones modulate/promote human sexual behaviour, including drive and arousal. Although literature corroborated the crucial role of Testosterone (increasing) and Prolactin (reducing) on desire (Gades *et al*., 2008; Reisman *et al*., 2015), results for other hormones are less clear. Hypothalamic neurohormones, such as Oxytocin and α-melanocyte-stimulating hormone, are currently under active research for therapeutic purposes. Hormonal treatment can improve libido in hypogonadal and hyperprolactinaemic men. Other evidence has shown that androgen deprivation therapy, which may be used as curative or palliative treatment in advanced Prostate Cancer, lowers libido (Corona *et al*., 2011).

Neuroimaging studies found that a significant activation of the medial Orbitofrontal Cortex region occurred in subjects with HSDD. The inhibitory role of this area resulted in a devaluation of sexual stimuli, which may be related to a continued activation of the ventromedial Prefrontal Cortex, a region that includes the medial Orbitofrontal Cortex in response to visual sexual stimuli. Sexual desire corresponded to the dorsal Caudal Anterior Cingulate Cortex - Ventral Striatal - Amygdala functional network. Higher subjective scores of sexual desire to explicit cues were associated with greater activity and enhanced functional connectivity between these areas (Cheng *et al.*, 2015).

Ageing and presence of organic diseases have a clear negative effect on overall sexual response (Hayes *et al*., 2007; McCabe *et al*., 2010; Simonelli *et al*., 2010; Corona *et al*., 2013; 2015; Angst *et al*., 2015; DeLamater & Koepsel, 2015; Rosen *et al*., 2016). Some of the recognised conditions associated with low sexual desire level are (Rubio-Aurioles & Bivalacqua, 2013; Yıldız & Bölüktas, 2015; Ozkan *et al*., 2015; Pedersen *et al*., 2015; Katz & Dizon, 2016):

- Androgen deficiency
- Antidepressant therapy
- Anxiety conditions
- Bodybuilding and eating disorders
- Cancer
- Coronary Disease and Heart Failure
- Depression
- Diabetes and Obesity
- Elevated levels of dopamine
- Epilepsy
- HIV
- Hyperprolactinemia
- Infertility
- Post-traumatic Stress Syndrome

- Prostatitis/Chronic Pelvic Pain Syndrome
- Renal failure
- Sexual Dysfunctions
- Stroke

It is clear that biological factors play a central role in sexuality, but they are not enough to explain human sexual response (Ozkan *et al*., 2015). According to the perspective advanced here, any psychological changes correspond to variations in the brain. Sex hormones are released into the blood by glands and travel to the brain where they sensitize specific regions, making them more responsive to sexual stimuli and thoughts. Reciprocally, events described as "psychological" can have effects throughout the body. For example, having a new sexual partner can increase sexual motivation, with effects in the hormones and the body (Toates, 2014). This relationship was explained by the terms "psychosomatic and somatopsychic", underling the continuous interaction between body and mind in producing health or illness status (Jannini *et al*., 2010; Simonelli *et al*., 2010).

In addition, it is very difficult to isolate the weight of physical components from their natural interaction with the psychosocial system (Carvalho & Nobre, 2011a; Carvalheira *et al*., 2014). For these reasons, an increasing importance of cognitive, emotional, relational, and sociocultural variables has been recognized in recent years, underlining the necessity to study them all together and not as isolated components of sexual desire (Berry & Berry, 2013).

1.4.2. Psychological factors

Among psychological factors, specific mood states can promote or inhibit sexual desire. Depression and anxiety have mostly been shown to be associated with low levels of desire (Lykins *et al*., 2006; Hartmann, 2007; Bancroft, 2009; Pastuszak *et al*., 2013; Carvalheira *et al*., 2014; Parish & Hahn, 2016). The loss of libido is perhaps the most common aspect of sexual functioning that is affected by depression or depressive symptoms (Laurent & Simons, 2009; Rajkumar & Kumaran, 2015). However, some studies have found also an increase of sexual desire level in association with

altered mood tone (Angst, 1998; Michael & O'Keane, 2000; Bancroft *et al*., 2003a; 2003b; Kafka, 2010; Atlantis & Sullivan, 2012). In a study of 919 heterosexual men, Bancroft and colleagues (2003a) revealed that among those with elevated levels of depression, 9% reported an increase in sexual interest and 42% a decrease. Among those showing significant anxiety, 21% declared an increase in sexual desire and 28% a decrease. These results have been replicated in a study on gay men (Bancroft *et al*., 2003b). A significant percentage of men had an increased interest in sex at times of depression or anxiety episodes, reporting that sex, particularly masturbation, helped to lower their level of negative emotions (Janssen & Bancroft, 2007).

In two recent studies (Carvalho & Nobre, 2011a; Carvalheira *et al*., 2014) anxiety was not a predictor of male desire level. Therefore, the mechanisms underlying the relationship between anxiety, depression, and sexual interest are still unclear and not necessarily linear (Atlantis & Sullivan, 2012).

Regarding emotional management, studies have reported conflicting results. Portuguese researchers have emphasized the centrality of emotions in male sexual response (Nobre & Pinto-Gouveia, 2003; 2006a; 2008). Emotions endorsed in sexual contexts, such as sadness and shame, were related to lower levels of sexual desire, even if they did not play a decisive role compared with the cognitive aspects (Carvalho & Nobre, 2011a; 2011b). Sexual dysfunctions are reported in association with a lack of positive affect, rather than with the presence of more negative emotions specific to sexual activity (Nobre & Pinto-Gouveia, 2006b). In an early study, Beck & Bozman (1995) showed that HSDD was strongly associated with feelings of anger and anxiety. Alexithymia has been found to have an important impact on male sexuality, principally on arousal and orgasmic phases. A few studies have found a minor connection with HSDD, despite the finding that alexithymia could decrease the ability to daydream and describe erotic thoughts (Madioni & Mammana, 2001; Simonelli *et al*., 2008; Michetti *et al*., 2006; 2007). Studies on addiction behaviours reported that higher sexual desire was also very associated with the abuse of Online Sexual Activities such as pornography, chatting, and sexting (Wéry & Billieux, 2016).

1.4.3. Sexual functioning

Distress and satisfaction about sexual activity are recognized as central elements of sexual functioning (Hendrickx *et al*., 2013; Carvalheira & Costa, 2015; Dosch *et al*., 2015; 2016a; 2016b). Positive and negative past experiences have a direct effect on sexual behaviour. Distress can differentiate between clinical and non-clinical levels of low sexual desire (Derogatis *et al*., 2012), whereas the level of sexual desire can predict sexual satisfaction (Mark, 2012; Mark & Murray, 2012). The level of desire not only leads to sexual behaviour, but it increases during any sexual experience (masturbation, intercourse, etc.) until the orgasm phase, and it seems to predict the quality and the satisfaction of the orgasm (Paterson *et al*., 2014).

Moreover, the presence of other sexual dysfunctions could have a negative effect on interest and the overall sexual function (Simonelli *et al*., 2010; Althof & Needle, 2011; Rosen *et al*., 2016). For example, erectile difficulties and premature ejaculation are reported as the most prevalent comorbidity among men with low levels of sexual desire (Carvalheira *et al*., 2014). Corona and colleagues (2013) reported from a retrospective study that reduced libido was comorbid in 38% of men claiming for erectile dysfunction, in 28.2% with premature ejaculation and 50% with delayed ejaculation, whereas it was isolated in 5.1%. At the same time, a better sexual function can increase sexual and relational satisfaction and the level of sexual desire.

1.4.4. Relational factors

The association with relational factors is also not clearly defined: sexual interest in men appears to be quite independently from couple dynamics, especially familiar and dyadic conflicts (Lachtar *et al*., 2006), and is more related to individual psychological factors (Boddi *et al*., 2015). In addition, desire for tenderness and closeness with a partner seem to decrease with the length of relationship, while sexual desire does not decrease (Klusmann, 2002; Murray & Milhausen, 2012; Martin *et al*., 2014). Carvalheira and colleagues (2014) reported conflicting results: men who were married and cohabitating for more than five years, with higher education, work stress, and couple conflicts

presented lower levels of desire. More than relationship duration, dyadic satisfaction and sociosexuality (individual willingness to engage in sexual activity outside of a committed relationship) may have a role on determining sexual interest (Bois *et al*., 2013; Grøntvedt *et al*., 2015). Day-to-day sexual drive and desire discrepancy are important indicators of the quality of sexual relationships and couple dynamics (Mark, 2012). Ridley and colleagues (2006) reported that positive feelings such as trust, intimacy, and good communication can increase sexual desire. Ferreira and colleagues (2015) showed that the factors associated with higher desire were "breaking the routine", "doing something different" exposing the couple to new positive experiences and "autonomy" (frequent physical distance, having personal projects which do not include the partner or a more psychological sense of "otherness", that is recognizing the partner as a separate person). "Stress", "couple conflicts", and "having children" were reported to be desire-diminishing factors. "Innovation", "sharing", "autonomy", and "effort" emerged as desire-promoting strategies, while "fostering personal interests", "investing in a positive connection", and "enhancing personal integrity" were identified as couples' strategies to promote and preserve differentiation of self. Intimacy has an important and positive role in male sexuality; in a recent study (Štulhofer *et al*., 2014) it was strongly associated with sexual satisfaction, and no evidence was found of a negative association between relationship intimacy and male sexual desire.

As monogamous heterosexual relationships progress, Klusmann (2002) has reported that men's sexual desire tends to remain high while women's sexual desire is found to decrease as early as one year into the relationship. Thus, while a couple may seem compatible in their sexual desire early in the relationship, over time the compatibility might decrease causing tension, especially among women. A recent study on men's experiences of sexual desire in long-term relationships (Murray *et al*., 2017) highlighted that, regardless of age or relationship duration, factors such as "feeling desired", "exciting and unexpected sexual encounters", and "intimate communication" were the most important eliciting factors of sexual desire. "Rejection", "physical ailments and negative health characteristics", and "lack of emotional connection with partner" were the main inhibiting factors. These findings

suggested that men's sexual desire may be more complex and relational than previous studies suggested.

1.4.5. Cultural factors

Both body and mind are strongly influenced by a third element which is frequently forgotten. Culture gives significance to emotions, behaviours and thoughts in every aspect of human life. Also in sexual behaviour, the influence of cultural aspects is dominant: practitioners should examine the real weight of cultural factors and deal with them in clinical work. As a result, there is the need for more multi-centred and multicultural studies which could explain the role of cultural messages, stereotypes and beliefs (Aumer, 2014; Neculaesei, 2015).

The impact of cultural factors has been less studied, if compared with physiological and psychological variables. Myths related to male sexual performance and sexual scripts (e.g., hostile and benevolent sexism) have primarily been examined in relation to other sexual problems such as Erectile Dysfunction (ED) (Nobre & Pinto-Gouveia, 2000; 2006a; Nobre *et al*., 2003; Purdon & Holdaway, 2006; Nobre, 2010; Morton & Gorzalka, 2013; Shamloul & Ghanem, 2013; Gledhill & Schweitzer, 2014). The most representative factor of male low desire seems to be the "Lack of Erotic Thoughts" during sexual activity (Nobre & Pinto-Gouveia, 2008; Carvalho & Nobre, 2011a; Peixoto & Nobre, 2014). Rigid thoughts about virility, focus on erection, and on sexual performance foster an unrealistic expectation of sexuality and lower confidence in erectile function (Carvalheira *et al*., 2014). Althof *et al*. (2011) reported that men treated in order to increase their confidence in their ability to perform sexually, increased in sexual desire too. Cognitive factors (beliefs related to restrictive attitudes towards sexuality, erection myths, and lack of erotic thoughts in a sexual context) were shown as strong predictors of low sexual desire in men (Carvalho & Nobre, 2011a; 2011b).

1.5. General aims of the project

The current project, part of a broader line of research on "Well-being and Sexuality", was conceived and realized by Professor Chiara Simonelli (Department of Dynamic and Clinical Psychology, Faculty of Medicine and Psychology, Sapienza University of Rome) in partnership with the Institute of Clinical Sexology (ISC) of Rome and with the psychosexual counselling service of the Policlinic "Umberto I" of Rome (Department of Urology "Ugo Bracci" and Department of Gynaecology and Obstetrics, "Sapienza" University of Rome).

Following the lead of the BPS model (Engel, 1977; 1980; Berry & Berry, 2013) and of some relevant studies in this field (Carvalho & Nobre 2011a; 2011b; Carvalheira *et al*., 2014; Dosch *et al*., 2015; 2016a; 2016b), the main objective of this project was to analyse the effect of several factors (psychological, emotional, cognitive, sexual, relational, and cultural) that literature has highlighted as connected with sexual desire and general sexual functioning in men. The project is organized in three different studies (pilot, full-scale analysis of the psychosocial factors, and models testing).

In the Study 1 and 2, we have explored the role of important dimensions such as Quality of Life (QoL), psychopathological symptoms, emotions endorsed during sexual activity, alexithymia, sexual functioning, sexual distress, sexual satisfaction, quality of dyadic relationship (if any), sexism, automatic thoughts and cognitive schemas during sexual activity, dysfunctional beliefs, and adherence to stereotypes about sexuality. Among these variables, we wanted to identify the best predictors of male sexual desire, in order to highlight the complexity of male sexual desire. For practical difficulties in collecting relevant physiological measures (e.g., hormones levels, neurotransmitters and neuroimaging), we focused on the psychosocial part of male sexual desire, constantly taking in our mind the wider BPS model and the important role played by the biological variables. Lastly, in the Study 3, we tested two Path Diagrams to point out the relationship between the psychosocial factors involved in determining the levels of sexual desire and discuss the possible clinical applications.

1.6. General method

1.6.1. Participants and procedures

Using a snowball recruitment (convenience sample), we reached a total of 869 male participants enrolled directly by researchers at "Sapienza" University of Rome, "Policlinico Umberto I" of Rome, Institute of Clinical Sexology (ISC) of Rome. The research was advertised on internet and social networks to reach more men. Participants answered a web-survey (available on "Google.docs" platform) assessing psychological and social aspects of sexual health.

All participants provided an informed consent and did not received any remuneration for taking part in this project. The protocol administered was completely anonymous: it was completed by volunteers, whose anonymity was guaranteed by creating an alphanumeric code with a procedure for which the researchers could not combine the code with the specific participant.

The data were collected in electronic form and were kept, always in the guarantee of anonymity, within the archives of the Institute of Clinical Sexology in Rome. The including criteria were being male, at least 18 years old and being prevalently heterosexual (first two points measured by the seven-points Kinsey scale) because most of the validated questionnaires available in literature and included in our protocol referred to adults and were heterosexual-oriented in the Italian version. Following these criteria, 748 men were eligible for the different studies and 121 (13.92%) men declared to be under 18 years old or were not prevalently heterosexual. The institutional ethics committee of the Department of Dynamic and Clinical Psychology, "Sapienza" University of Rome, provided approval to carry out the research on 21 January 2015. Data was collected from March 2015 to May 2017. The characteristics of the groups will be presented in each study.

1.6.2. Measures

A wide protocol composed by 16 self-report questionnaires exploring different psychosocial factors was administered in line with the aims of the project and the state of the art of the literature.

Following, all the questionnaires used in the project are presented. They were not assessed in all the three studies: a selection was made after the pilot, in order to improve the protocol deleting any redundant or ineffective measure. On Figure 1 (page 76), a representation of the peculiar areas investigated by the protocol is presented inside the BPS framework. This classification is sometimes mechanic and arbitrary as far as some questionnaires involve more than one area.

A *Socio-demographic questionnaire* was created to collect general information such as age, sexual orientation (measured with 7-points Kinsey scale), relational and marital status, educational level, work status, children, smoking habits, alcohol and drug use/abuse, presence and duration of sexual difficulties.

The *International Index of Erectile Function* (IIEF; Rosen *et al*., 1997) is a widely used, multi-dimensional 15-item instrument for the evaluation of male sexual function. A general index of sexual function and five specific dimensions can be calculated: Erectile Function, Orgasmic Function, Sexual Desire, Satisfaction with Intercourse, and Overall Satisfaction. Higher scores indicate better sexual functioning. Psychometric studies reported good reliability, validity and the ability to discriminate between clinical and non-clinical sexual subjects. In this project, the Sexual Desire scale was used as a dependent variable to assess male sexual desire level. The Cronbach's alpha values for this measure in the current project ranged from .83 (Sexual Desire) to .94 (Overall Satisfaction).

The *Short Form 36 for Quality of Life* (SF-36; Ware & Sherbourne, 1992; Apolone & Mosconi, 1998) is a 36-item instrument of generic, coherent, and easily administered QoL measure. The SF-36 is widely used in clinical practice and research to evaluate QoL and as an outcome for medical and psychological treatments. The SF-36 is composed of nine scales: Physical Functioning, Role Functioning/Physical, Role Functioning/Emotional, Energy/Fatigue, Emotional Well-Being, Social Functioning, Pain, General Health, and Health Change. Higher scores indicate better QoL. The Cronbach's alpha values for this measure in the current project ranged from .73 (Pain) to .86 (Physical Functioning).

The *Beck Depression Inventory II* (BDI II; Beck *et al*., 1996) is an effective measure of depressive symptoms evidenced by its widespread use in the clinical and research field. BDI II represents an improvement over the first version across all aspects including content, external, and psychometric validity. The Cronbach's alpha value in the current project was .89.

The *State-Trait Anxiety Inventory Form Y* (STAI-Y; Spielberger, 2010) is a 40-item questionnaire pertaining to anxiety symptoms, reporting good levels of reliability and validity. Anxiety may occur as a reaction to stressful situations or may be associated with psychological disorders. The STAI-Y measures state and trait anxiety and is used in making diagnoses in clinical settings as well as in research. Higher scores suggest higher levels of anxiety. The Cronbach's alpha values for this measure in the current project ranged from .75 (Trait Anxiety) to .76 (State Anxiety).

The *Symptom Check List-90-Revised* (SCL-90-R; Derogatis, 1994; Prunas *et al*., 2012) is a commonly used checklist measuring the severity of self-reported psychopathological symptoms on a 5-point Likert scale ranging from "Not at all" to "Extremely". The SCL-90-R includes nine sub-scales exploring the previous seven days' condition: Somatization (SOM) Obsessive-Compulsive (O-C); Interpersonal Sensitivity (I-S); Depression (DEP); Anxiety (ANX); Hostility (HOS); Phobic Anxiety (PHOB); Paranoid Ideation (PAR); Psychoticism (PSY). It is used in clinical practices as a general screening of the psychological state of the patient and has been also adopted in psychotherapy as an outcome measure. The validity of the nine symptom sub-scales of the SCL-90-R demonstrated good internal consistency. The Cronbach's alpha values for this measure in the current project ranged from .77 (Psychoticism) to .91 (Depression).

The *Positive and Negative Affect Schedule* (PANAS; Watson *et al*., 1988; Terracciano *et al*., 2003) is a 20-item self-report independent measure of Positive and Negative Affects. Respondents are asked to rate their experience of each emotion presented within a specified period or situation (in our case, during sexual activity). Higher scores indicate higher emotions' endorsement. The Cronbach's alpha values for this measure in the current project ranged from .84 (Positive Affects) to .87 (Negative Affects).

The *Toronto Alexithymia Scale - 20* (TAS-20; Bagby *et al*., 1994a; 1994b; Bressi *et al*., 1996) measures a general dimension of alexithymia and three main factors (Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally-Oriented Thinking). The TAS-20 demonstrated adequate internal and test-retest reliability. The Cronbach's alpha values for this measure in the current project ranged from .77 (Difficulty Describing Feelings) to .82 (Externally-Oriented Thinking).

The *Premature Ejaculation Severity Index* (PESI; Metz & McCarthy, 2003) is a 10-item questionnaire exploring the general experience of Premature Ejaculation (PE) on a multidimensional perception: IELT (Intravaginal Ejaculation Latency Time), personal distress, sexual satisfaction, comorbidities with other sexual dysfunctions, ejaculatory control, partner's concern, and impact of symptoms on the QoL. Items are summed up in a single main dimension revealing the severity of the condition. The Cronbach's alpha value for this measure in the current project was .86.

The *Sexual Distress Scale for Males* (SDS-M; Derogatis *et al*., 2002) is a 12-item questionnaire to assess personal distress related to sexuality with one main score. It was previously used on females in combination with FSFI. Test-retest reliability and internal consistency coefficients were acceptable. The scale showed a discriminant ability distinguishing between sexually dysfunctional and functional subjects. For this project, the questionnaire was translated in Italian, adapted for the male population and used in combination with IIEF. The Cronbach's alpha value for this measure in the current project was .96.

The *Sexual Satisfaction Scale for Males* (SSS-M; Meston & Trapnell, 2005) is a 30-item measure of sexual satisfaction composed of five factors: Contentment, Communication, Compatibility, Relational and Personal Concern. It displayed good psychometric properties and discriminative capability between sexual clinical and healthy subjects. For this project, it was translated in Italian and adapted for the male population. The Cronbach's alpha value for this measure in the current project ranged from .84 (Communication) to .95 (Relational Concern).

The *Dyadic Adjustment Scale* (DAS; Spanier, 1976) is a 32-item scale designed to assess dyadic adjustment quality according to four dimensions in coupled subjects: Dyadic Consensus, Dyadic Satisfaction, Dyadic Cohesion, and Dyadic Affection. The questionnaire showed good internal consistency and construct validity. The Cronbach's alpha values for this measure in the current project ranged from .79 (Dyadic Affection) to .89 (Dyadic Consensus).

The *Ambivalent Sexism Inventory* (ASI; Glick & Fiske, 1996) is a 22-item measure designed to assess sexist attitudes towards women from a six-point Likert scale ranged from "0 = Strongly disagree" to "5 = Strongly agree". Total score and two sub-scales (Hostile and Benevolent Sexism) can be calculated. The Cronbach's alpha values for this measure in the current project ranged from .78 (Benevolent Sexism) to .83 (Hostile Sexism).

The *Sexual Modes Questionnaire* (SMQ; Nobre & Pinto-Gouveia, 2003; Nimbi *et al*., 2018) is a 30-item measure to assess connection of automatic thoughts, emotions, and sexual responses in a sexual context. The male version is composed of five dimensions: Erection Concerns Thoughts (ECT), Lack of Erotic Thoughts (LET), Age and Body related Thoughts (ABT), Negative Thoughts toward Sex (NTS), and Failure Anticipation Thoughts (FAT). "Emotions Endorsement" and the level of "Subjective Sexual Response to Thoughts" can be calculated. Higher scores correspond to the presence of more negative thoughts, higher endorsements of emotions and sexual response. In the study 1 was used the original version (Nobre & Pinto-Gouveia, 2003); in the Study 2 and 3 it was used the new Italian validated version (Nimbi *et al*., 2018). Test-retest reliability and internal consistency were supported by psychometric studies in both versions. The SMQ can discriminate dysfunctional from functional men. Cronbach's alpha values in the current project ranged from .79 (Negative Thoughts toward Sex) to .87 (Erection Concern Thoughts) in the original version and from .81 (Negative Thoughts toward Sex) to .88 (Erection Concern Thoughts) in the Italian version.

The *Sexual Dysfunctional Belief Questionnaire* (SDBQ; Nobre *et al*., 2003; Nimbi *et al*., *under review*) is a 40-item measure which evaluates six classes of beliefs on sexuality on the original version (Sexual Conservatism, Female Sexual Power, "Macho" Beliefs, Beliefs about Women's Sexual

Satisfaction, Restricted Attitudes Toward Sexual Activity, and Sex as an Abuse of Men's Power) and three in the Italian validation: Macho Belief (MB), Sexual Conservatism (SC), and Control over Sexuality (CS). In the study 1 was used the original version (Nobre *et al*., 2003); in the Study 2 and 3 it was used the new Italian validated version (Nimbi et al., *under review*). Answers are ranged on a five-point Likert scale from "1 = Completely disagree" to "5 = Completely agree". Higher scores indicate the presence of more dysfunctional sexual beliefs. Good coefficients of test-retest reliability and internal consistency were shown in both versions. The SBDQ can discriminate sexually dysfunctional from functional men. Cronbach's alpha values in the current project ranged from .77 (Restricted Attitudes Toward Sexual Activity) to .90 (Beliefs about Women's Sexual Satisfaction) in the original version and from .80 (Control over Sexuality) to .89 (Macho Beliefs) in the Italian version.

The *Questionnaire of Cognitive Schema Activation in Sexual Context for Men* (QCSASC; Nobre & Pinto-Gouveia, 2009; Nimbi *et al*., *under review*) assesses the activation of 28 self-schemas usually associated with psychological problems after the presentation of four events of sexual dysfunctions. Five dimensions were revealed in the original version (Undesirability-Rejection, Incompetence, Self-Depreciation, Difference-Loneliness, and Helpless) and two in the Italian validation: Helpless and Unlovable. In the study 1 was used the original version (Nobre & Pinto-Gouveia, 2009); in the Study 2 and 3 it was used the new Italian validated version (Nimbi *et al*., *under review*). The QCSASC showed good internal consistency, test-retest reliability, convergent validity, and incremental validity. It can discriminate between sexually clinical and non-clinical groups. Cronbach's alpha values for this measure in the current project ranged from .84 (Difference/Loneliness) to .93 (Undesirability/Rejection) in the original version and .95 for both Helpless and Unlovable sub-scales in the Italian version.

1.6.3. Data analysis

In order to fullfill the specific aims of the project, varius psychometric analyses were used in the different phases. Generally, Pearson Correlations were performed to explore the association between the Socio-demographic variables and the level of sexual desire or to have a general idea of the relationship between the psychosocial variables. Hierarchical Multiple Regression analyses (enter method) having some Socio-demographic variables (e.g., Age, Relational Status, etc.) as covariates were performed on the sub-scales of each questionnaire, in order to identify the best predictors of sexual desire in men for every area (QoL, Psychopathological Symptoms, Emotions, Alexithymia, Sexual Functioning, Sexual Satisfaction, Sexual Distress, Dyadic Adjustment, Sexism, Negative Automatic Thoughts, Dysfunctional Sexual Beliefs, and Cognitive Schemas). After analizing all the considered class of factors, a final Hierarchical Multiple Regression analysis (enter method) including all the significant variables from the previus regressions was executed to find the main predictors of sexual desire (independently from the area). Bonferroni-corrected alpha levels were used for each multiple regression to prevent from type I error. The best predictors were used to build two different causal models (path diagrams) and test the relationships between psychosocial variables in determining the level of sexual desire. In this stage, Path Analyses were performed through Structural Equation Modelling (SEM) approach. The statistical analyses were done using IBM SPSS v. 23.0 and IBM SPSS Amos v.22 (SPSS Inc., Chicago, IL, USA).

2. Study 1: Psychosocial predictors of male sexual desire (pilot)

2.1. Aims

The main objective of the Study 1, as a pilot, was to evaluate feasibility, time, cost, adverse events, and effect size to predict an appropriate sample size and improve upon the project design prior to perform a full-scale study. Several factors (psychological, emotional, sexual function, relational, and cultural) highlighted by the literature as connected with sexual desire in men were tested in this phase, focusing on measures goodness.

The final objective was to identify the main predictors of male sexual interest among the areas selected, to be included in the second phase of data collection. In line with available literature, we hypothesized the following associations with lower levels of sexual desire: worse QoL, higher presence of psychological symptoms, greater endorsement of negative emotions during sexual activity, higher level of alexithymia, more sexual distress, lack of sexual satisfaction, worse sexual functioning, lower levels of dyadic adjustment, higher level of sexism, higher presence of dysfunctional beliefs, automatic thoughts, and cognitive schemas.

2.2. Participants and procedures

Following the inclusion criteria, a total of 298 heterosexual men (first two points measured by the seven-points Kinsey scale) was considered for the first study. The socio-demographic characteristics of the group are presented on Table 1 (page 77). The mean age of the participants was 32.66±11.52 (ranged between 18-72). Most of the men reported their relationship status as unmarried and coupled (with one third of the total sample being single, one third coupled and cohabitating, and one third coupled and not cohabitating); most men neither had children nor desired children at the time of the

survey. They had a medium-high educational level and mostly were employed. In accordance with recent epidemiological data (McCabe *et al*., 2016), in our study population 3 out of 10 declared to have at least one sexual problem in the last six months (mean duration = 48.37±74.27 months) and to have a "moderate to high" level of sexual desire (as declared on IIEF, item 12). Comparing to Italian socio-demographic statistics (ISTAT, 2011), the group seemed to be quite representative of the male population, even if the sampling size and methods do not allow them to be considered as a "representative" group. In order to reach a wider variance in data (Cohen & Cohen, 2013), we analysed people both with and without sexual problems together in order to discuss more realistic results in the following hierarchical regression analyses. Moreover, we assessed some specific questionnaires on sexual functioning and related distress to evaluate the direct effect of sexual complaints on the sexual desire. For this study, 15 questionnaires were considered and discussed (Table 2, page 78), for about 45 minutes of administration.

2.3. Data analysis

Hierarchical Multiple Regression analyses (enter method) were performed for each class of factors (QoL, Psychopathological Symptoms, Emotions, Alexithymia, Sexual Functioning, Sexual Satisfaction, Sexual Distress, Dyadic Adjustment, Sexism, Negative Automatic Thoughts, Dysfunctional Sexual Beliefs, and Cognitive Schemas) to identify the main predictors of Sexual Desire within each class (Table 3, pages 79-80). The effect of some Socio-demographic variables such as Age, Relational Status (coded as being or not in a couple), Desire of Having a Baby, Educational Level, Having or not having a Sexual Problem in the last 6 months, and the Duration of symptoms was controlled due to their possible disturbing effect on the other variables, as underlined by literature and clinical experience. These variables entered the first steps of all Hierarchical Regressions in order to be considered as covariates. To prevent type I error, significance level was based on Bonferroni corrected alpha in each regression. A final Hierarchical Multiple Regression

analysis, including the previous significant variables and the covariates, was performed to find the best predictors of male sexual desire (Table 4, page 81). A Pearson Correlations matrix (Table 5, page 82) was built between the variables entered in the final regression model to observe and discuss associations between predictors. Moreover, a figure showing the relationship between percentage of variance explained by different class of predictors (regression models) is reported (Figure 2, page 83). All statistical analyses of this phase were performed using SPSS v. 23.0 (SPSS Inc., Chicago, IL, USA).

2.4. Results

Socio-demographic variables: "Age", "Relational Status", "Desire of Having a Baby", "Educational Level", "Sexual Problems", and "Duration" were selected as Socio-demographic variables of interest on sexual desire, as reported by literature. Their effects were evaluated with a multiple regression using level of Sexual Desire (IIEF) as the dependent variable (Table 3, Step 1). A significant model was shown ($F_{(6,292)}$=2.663; p<.05; R^2=.061). Using the Bonferroni correction (p<.008), with the emerging predictor "Desire of Having a Baby" indicating that men who desired children at the time of the survey reported significantly lower levels of sexual desire. This model was used as a first step (considering Socio-demographic variables as covariates) for all the following Hierarchical Multiple Regressions.

Quality of Life (QoL): was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.1). A significant model was shown ($F_{(13,244)}$=2.818; p<.01; ΔR^2=.083). Using the Bonferroni correction (p<.004), the predictor "Energy/Fatigue" was significant, indicating that a higher perceived energy level was associated with a higher level of Sexual Desire.

Psychopathological Symptoms: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.2). A significant

model was revealed ($F_{(18,241)}$=1.713; p<.05; ΔR^2=.064). Using the Bonferroni correction (p<.003), the predictor "Depression" from SCL-90-R was the single significant association, indicating that a higher presence of depressive symptoms was associated with a lower level of Sexual Desire.

Emotional Response: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.3). A significant model was revealed ($F_{(16,246)}$=3.125; p<.001; ΔR^2=.127). Using the Bonferroni correction (p<.004), the predictor "Fear" was the only significant, indicating that a higher endorsement of this emotion in sexual context was associated with a lower level of Sexual Desire.

Alexithymia: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.4). A significant model was shown ($F_{(9,252)}$=2.473; p<.05; ΔR^2=.024), but using the Bonferroni correction (p<.006), no factor was significant.

Sexual Functioning: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.5). A significant model was shown ($F_{(10,254)}$=6.039; p<.001; ΔR^2=.138). Using the Bonferroni correction (p<.005), only the covariate "Desire of Having a Baby" emerged as significant factor, meaning that the men wanting to have a child reported lower desire levels (the effect of the covariate is stronger than any sub-scale of sexual function evaluated).

Premature Ejaculation Severity: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.6). A significant model was reported ($F_{(7,245)}$=3.747; p<.01; ΔR^2=.037). Using the Bonferroni correction (p<.005), the predictor "Premature Ejaculation Severity" was significant, indicating that a higher level of severity was associated with a lower level of Sexual Desire.

Sexual Satisfaction: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.7). A significant model was reported ($F_{(11,239)}$=3.881; p<.001; ΔR^2=.052). Using the Bonferroni correction (p<.005), the predictor

"Compatibility" was significant, indicating that a higher level of sexual compatibility was associated with a higher level of Sexual Desire.

Sexual Distress: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.8). A significant model was reported ($F_{(7,253)}$=3.048; p<.01; ΔR^2=.019). Using the Bonferroni correction (p<.005), the predictor "Sexual Distress" was significant, indicating that a higher level of sexual distress was associated with a lower level of Sexual Desire.

Dyadic Adjustment: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.9). Only subjects in a relationship were considered for this analysis (n=192). A significant model was reported ($F_{(9,179)}$=3.121; p<.01; ΔR^2=.026). Using the Bonferroni correction (p<.005), only the covariate "Desire of Having a Baby" emerged as significant factor, meaning that the men wanting to have a child reported lower desire levels (the effect of the covariate is stronger than any sub-scale of dyadic adjustment evaluated).

Sexism: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.10). A significant model was reported ($F_{(8,201)}$=2.834; p<.01; ΔR^2=.011). Using the Bonferroni correction (p<.006), no factor was significant.

Negative Automatic Thoughts: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.11). A significant model was reported ($F_{(11,226)}$=4.450; p<.001; ΔR^2=.120). Using the Bonferroni correction (p<.005), the predictor "Lack of Erotic Thoughts" was significant, indicating that a lower presence of erotic thoughts was associated with a lower level of Sexual Desire.

Subjective Sexual Response: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.12). A significant model was reported ($F_{(7,226)}$=3.927; p<.001; ΔR^2=.046). Using the Bonferroni correction (p<.007), the predictor

"Subjective Sexual Response" was significant, indicating that a higher level of sexual activation during sexual automatic thoughts was associated with a higher level of Sexual Desire.

Dysfunctional Sexual Beliefs: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.13). A significant model was reported ($F_{(11,237)}$=3.029; p<.01; ΔR^2=.121). Using the Bonferroni correction (p<.004), the predictor "Sexual Conservatism" was significant, indicating that a higher presence of conservative beliefs about sexuality was associated with a lower level of Sexual Desire.

Cognitive Schemas Activated during Sexual Activity: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 3, Step 2.14). A significant model was reported ($F_{(11,237)}$=3.029; p<.01; ΔR^2=.062). Using the Bonferroni correction (p<.005), only the covariate "Desire of Having a Baby" emerged as significant factor, meaning that the men wanting to have a child reported lower desire levels (the effect of the covariate is stronger than any sub-scale of cognitive schemas evaluated).

Main Predictors of Male Sexual Desire: According to the final aim of this study, that is evaluating the overall best predictors of male sexual desire, we conducted a Hierarchical Multiple Regression using level of Sexual Desire (IIEF) as the dependent variable with Socio-demographic variables as covariates (Table 4, Model 1), and using as predictors the factors found as significantly associated with Sexual Desire in the previous analyses (Energy/Fatigue, Depression, Fear, Premature Ejaculation Severity, Compatibility, Sexual Distress, Lack of Erotic Thoughts, Subjective Sexual Response, and Sexual Conservatism) (Table 4, Model 2). The analysis revealed a significant general model explaining 28.1% of variance in Sexual Desire ($F_{(15,179)}$=9.514, p<.001, R^2=.281). Using the Bonferroni correction (p<.003), the main predictors were "Lack of Erotic Thoughts", "Fear" and "Desire of Having a Baby". Moreover, "Lack of Erotic Thoughts" showed to be the best predictor of Sexual Desire.

2.5. Discussion

The aim of Study 1 was to investigate the role of selected psychological and social factors on male sexual desire. Working from the foundation laid by the studies of Carvalho & Nobre (2011a; 2011b), the number of factors analysed was increased (such as QoL, Alexithymia, Sexism, Sexual Function, Distress, and Satisfaction) in order to have a more detailed view of male sexual interest, compliant with the BPS model. The data showed a complex situation in which many predictors were not significantly associated with the level of Sexual Desire in men or, at least, explained a very low amount of variance (R^2).

Considering Socio-demographic variables, only "Desire of Having a Baby" was negatively associated with Sexual Desire level. The presence of conflictual issues regarding paternity should be better investigated: from a clinical point of view, a rational willingness for paternity could be associated with unconscious fears about changes in lifestyle, new responsibilities, loss of independence and couple intimacy, all factors that can negatively affect desire level.

The association between current desire of having a baby and lower level of sexual drive could also be explained by a shift in the purpose of physical intimacy from pleasure to reproduction. This important change in sexual motivation could directly affect sexual interest. Moreover, studies on infertility highlighted how, when sex is planned and implemented mainly for reproduction, men report a reduction of desire and satisfaction (Lenzi *et al*., 2003; Ramezanzadeh *et al*., 2006; Piva *et al*., 2014). In contrast with the current literature, in our study neither age nor relationship was associated with level of sexual desire. This was perhaps due to the overall youth of our sample. In our data, the presence of sexual problems (whether short or long term) was not directly associated with level of sexual desire. When distress about the sexual problem was present, there was an association with changes in level of desire. People with sexual difficulties but low distress about those problems did not report changes in desire levels leading to a conclusion that lack of sexual distress (Hendrickx *et al*., 2014) could play a mediating effect on sexual symptoms.

Considering QoL, the main predictor of sexual interest was "Energy/Fatigue", which explains how the personal feeling of being active, dynamic, and energetic is related to higher sexual drive. The positive association between healthy sexual functioning and energetic aspects of QoL is well established in literature and it confirms the protective role of sexuality in daily life (Sanchez-Cruz *et al*., 2003; Monga *et al*., 2004; Lau *et al*., 2005).

Considering psychological symptoms, the main predictor associated with low level of Sexual Desire was "Depression". Our results are in line with other studies which have found a direct relationship between depressive symptoms, low sexual desire, and reduced energy levels (Bancroft *et al*., 2003a; 2003b; Basson *et al*., 2010; Khoo *et al*., 2010; Dinas *et al*., 2011; Carvalheira *et al*., 2014). Low energy and fatigue are parameters of depression states, as recognized in literature and clinical practice. It is not surprising that these variables showed high correlations with low sexual desire in our group. However, when these variables were included in the final regression, they did not show a strong effect on desire and they did not explain a relevant amount of variance. The precise roles of depression and anxiety are still a matter of debate (Atlantis & Sullivan, 2012): there is the need to further explore this aspect while searching for mediator variables or non-linear associations with sexual interest (given that depression and anxiety may be associated with both high and low levels of desire).

Considering alexithymia, no significant factor was revealed. Our findings suggested that difficulty in processing emotions does not directly affect the ability to erotically fantasize and to sexually behave. Meanwhile the association is strong with other male sexual problems such as ED and PE (Michetti *et al*., 2006; 2007; Simonelli *et al*., 2008). Regarding emotions triggered by sexual thoughts, we also found, in line with Carvalho & Nobre (2010), a significant effect of "Fear" on Sexual Desire and a significant model explaining 12.70% of variance. Sexual desire in men appears to be strongly influenced by emotions as well as for women, even if with some gender peculiarities. Men grow up dealing with strong stereotypic messages about machismo and virility, mainly based on "performance

issues" (Masters *et al*., 2013; Sun *et al*., 2016). Men could be afraid of showing their sensibility and weakness, and this fear could lower interest in being involved in sexual situations.

Sexual functioning showed a significant model explaining 13.8% of variance. Many studies (Fugl-Meyer & Sjogren, 1999; Sanchez-Cruz *et al*., 2003; Monga *et al*., 2004; Laumann *et al*., 2005; Carvalheira *et al*., 2014) reported that the general sexual function has an impact on sexual desire, more in women than in men. In our data, no single significant factor emerged among the IIEF sub-scales, but "Premature Ejaculation Severity" (a measure of both symptoms severity and distress) had a significant prediction role on Sexual Desire. In this case, men who complained about severe PE reported lower desire. To better understand these results, we should examine them in association with distress and satisfaction. Our data showed a significantly role with a small effect size played by both "Distress" and "Sexual Satisfaction" (low percentage of explained variance). Looking at the correlation matrix, Sexual Distress is associated with having Sexual Problems and PE; Satisfaction seems to be more related to cognitive aspects of sexuality than directly to functioning. Recent studies have highlighted how distress negatively influences Sexual Desire (Dosch *et al*., 2016a; 2016b; Hendrickx *et al*., 2013; 2016) and sexual self-confidence (the way a person feels his/her ability to behave sexually) (Hendrickx *et al*., 2014; 2016). Previous research emphasised how men are focused more on sexual performance and partner judgement than personal sexual satisfaction (Purdon & Holdaway, 2006; Nobre & Pinto-Gouveia, 2008; Montorsi *et al*., 2010). These elements seem to suggest that personal satisfaction is less important in men than distress or sexual functioning in terms of affecting sexual drive.

Considering dyadic adjustment, no significant factor was revealed. Literature describes relationship as a controversial factor in sexual interest: some research focused on length of relationship (Klusmann, 2002; Murray & Milhausen, 2012) and others on couple satisfaction (Ridley *et al*., 2006; Bois *et al*., 2013; Carvalheira *et al*., 2014) as predictors of Sexual Desire. Other studies report that male desire is less affected by dyadic conflicts than female desire (Lachtar *et al*., 2006). Reflecting on both the most current literature and the data in our study, it seems that relationship does

not have a direct effect on the level of sexual desire, which may be influenced by other submerged factors.

Considering cultural aspects such as sexism, no significant factor was shown. This is the first study that has addressed whether sexism is associated with sexual desire in males, and unexpectedly, based on our clinical experience and on research on females (Wood *et al*., 2006), it did not show any direct effect on interest. Cultural aspects are very important in desire and sexual functioning, but maybe stereotypes on gender roles and male attitudes about women have a stronger effect on couple dynamics than directly on sexual response (Wood *et al*., 2006; Karakurt & Cumbie, 2012; Harris *et al*., 2016).

Findings regarding negative automatic thoughts, dysfunctional beliefs and cognitive schemas activated in sexual contexts indicated that "Lack of Erotic Thoughts", "Sexual Conservatism" and "Subjective Sexual Response (triggered by automatic thoughts on sexuality)" were significant predictors of Sexual Desire explaining a significant amount of variance. As first described by Carvalho & Nobre (2011a; 2011b), cognitive facets are closely connected with desire level and, in general, with sexual function. Moreover, the importance of attentional focus during sexual activity is clear: distracting thoughts are involved in generating and maintaining psychogenic erection problems (Both *et al*., 2011), and could have a central role in the interest process as well. Men may shift attention from erotic fantasies or sensation to performance and partner satisfaction, overshadowing their own sexual pleasure, and subsequently losing the power to trigger sexual response (Prause *et al*., 2008; Nelson & Purdon, 2011; Oliveira *et al*., 2014).

The final multiple regression analysis revealed "Lack of Erotic Thoughts", "Fear", and "Desire of Having a Baby" as the main predictors of male Sexual Desire. The general model showed a medium effect size accounting for 22.0% of variance in sexual interest (Cohen & Cohen, 2013). "Energy/Fatigue", "Depression", "Premature Ejaculation Severity", "Compatibility", "Sexual Distress", "Subjective Sexual Response", and "Sexual Conservatism" showed weaker effects. In accord with the BPS model, psychological and social factors are confirmed as having an important

role on modulating Sexual Desire levels. These results seem to suggest that sexual functioning, cognitive, and emotive factors have a primary role in the male sexual interest process. Focusing on the explained variance, the most relevant classes of factors for Sexual Desire are Sexual Functioning (13.80%), Emotional Response (12.70%), Negative Automatic Thoughts (12.10%) and Dysfunctional Sexual Beliefs (12.00%). Other classes of factors seem to be comparatively of lower importance.

Findings from this study should be interpreted with caution due to some limitations. The protocol was composed of self-report questionnaires, some of which were translated scales (SDS, SSS, SMQ, SBDQ, and QCSASC) that have yet to be validated for the Italian language. Nevertheless, SDS and SSS were administrated in association with other validated measures (such as IIEF and DAS) to control for the lack of other measures' validity. SMQ, SBDQ, and QCSASC are validated and recognized measures on cognitive/cultural aspects in many countries, but they pose some interpretational problems: some of the sub-scales presented are not clear or easy to understand for both researchers and subjects (e.g., Sexual Response, Restrictive Attitude towards Sex, and Female Sexual Power). Deepening the analysis of desire predictors with validated versions of these tools will be of significant help for future studies.

Additionally, snowball sampling was used both for ease of reaching study volunteers and having more case variety; however, it leads to concerns regarding the generalization of the results. Our group, even if demonstrating a good variability, is not representative of the entire Italian male population and could better describe the cohort of young adults. To limit this bias, Socio-demographic variables were considered as covariates in all the analyses. Despite these limitations, the present study contributes to the current knowledge on the variables associated to male sexual desire and allowed us to make some methodological considerations for the following studies.

Our main focus in this phase of the project was the improvement of the research protocol. Questionnaires such as BDI II and STAI-Y were deleted from the protocol, in order to accelerate the questionnaire administration. Depression and anxiety were still covered by the SCL-90-R, which also resulted as the only psychopathological measure predictive in the analyses. The SDBQ, the SMQ and

the QCSASC were validated in Italian by the authors: the new versions reported better psychometric indexes than the original ones and were included in the protocol for the Study 2 and 3. Moreover, for the SMQ was used only the sub-scale "Automatic Thoughts", to avoid the high rate of comprehension problems of the other two scales (Emotional and Sexual Response). To measure the emotional response, following the suggestion of Pereira *et al*. (2016; 2017) and Peixoto *et al*. (2016; 2017), the questionnaire PANAS was added to the protocol, as it seemed a suitable alternative, easier to use and understand. At the end, the new protocol covered the same principal areas of the first one, but resulted to be slimmer, easier, and faster (about 35 minutes) and centred on the aims of the project, without tiring too much the participants.

Once the new protocol was ready to be published online, we were able to start the new administration by going to phase two of the project.

3. Study 2: Psychosocial predictors of male sexual desire (full-scale study)

3.1. Aims

The main objective of the Study 2 was to collect data from a wider sample with the new protocol, built to solve some problems highlighted and discussed in the pilot study: measures redundancy, better emotions evaluation, and employment of SMQ, SDBQ, and QCSASC validated forms for the Italian population. Also in this phase, several factors connected with sexual desire in men (psychological, emotional, sexual function, relational, and cultural variables) were tested. The final objective, once again, was to identify the best predictors of male sexual interest among the areas selected, in order to lay the foundations for the construction of a new conceptual model of sexual desire functioning in men, which will be tested in the third phase of the current project.

In line with the Study 1, we hypothesized to find in association with lower level of sexual desire: worse QoL, higher presence of psychological symptoms (in particular depression), greater endorsement of negative emotions during sexual activity, higher level of alexithymia, more sexual distress declared, lack of sexual satisfaction, worse sexual functioning, lower levels of dyadic adjustment, higher level of sexism, higher presence of dysfunctional beliefs, automatic thoughts, and cognitive schemas.

3.2. Participants and procedures

For the second and the third study, 450 heterosexual men (first two points measured by the seven-points Kinsey scale) were considered. The socio-demographic characteristics of the group are presented on Table 6 (page 84). The mean age of participants was 31.36±10.73 (ranged between 18-76). Most of the men reported their relationship status as unmarried and coupled (with one third of

the total sample being single, one third coupled and cohabitating, and one third coupled and not cohabitating); most men neither had children nor desired children at the time of the survey. They had a medium-high educational level and mostly were employed or student. Regarding risky behaviours, 36.0% declared to smoke, 90.9% to consume alcohol (from a few times a month to everyday) and 22.5% drugs (in addition to 27.1% that used them in the past). In accordance with recent epidemiological data (McCabe *et al*., 2016), in our study population 3 out of 10 reported at least one sexual problem in the last six months (mean duration = 46.31±74.42 months). Regarding sexual desire, the group reported a "moderate to high" level of sexual desire (as declared on IIEF, item 12). Comparing to Italian socio-demographic statistics (ISTAT, 2011), the group seemed to be quite representative of the Italian male population, even if the sampling size and methods do not allow them to be considered as a "representative" group. In order to reach a wider variance in data (Cohen & Cohen, 2013), we analyzed people both with and without sexual problems together in order to discuss more realistic results in the following hierarchical regression analyses. Moreover, we assessed some specific questionnaires on sexual functioning and related distress to evaluate the direct effect of sexual complaints on sexual desire. For this study, 14 questionnaires were assessed and discussed (Table 7, page 85), for about 35 minutes of administration.

3.3. Data analysis

Firstly, a Pearson Correlations matrix (Table 8, page 86) was built between Socio-demographic variables and Sexual Desire levels to explore the possible associations. This procedure was necessary, together with the results of the pilot study and the literature outcomes, in the decision-making process of which variables could have a possible disturbing effect on the final results. Age, Relational Status (coded as being or not in a couple), Desire of Having a Baby, Educational Level, Drugs Use, and Having or not having a Sexual Problem in the last 6 months were selected following the up-cited criteria (Age and Sexual Problems were significantly correlated with Sexual Desire; Desire of Having

a Baby was shown as a significant predictor in the pilot study; Relational Status, Educational Level, and Drugs Use were highlighted in literature as disturbing variables). These variables entered the first step of all Hierarchical Multiple Regressions in order to be considered as covariates. Hierarchical Multiple Regression analyses (enter method) were performed for each class of factors (QoL, Psychopathological Symptoms, Emotions, Alexithymia, Sexual Functioning, Sexual Satisfaction, Sexual Distress, Dyadic Adjustment, Sexism, Negative Automatic Thoughts, Dysfunctional Sexual Beliefs, and Cognitive Schemas) to identify the main predictors of Sexual Desire within each class (Table 9, pages 87-88). To prevent type I error, significance level was based on Bonferroni corrected alpha in each regression.

A final Hierarchical Multiple Regression analysis, including the previous significant variables and the covariates, was performed to find the best predictors of male sexual desire (Table 10, page 89). A second Pearson Correlation matrix (Table 11, page 90) was built between the variables entered in the final regression model to observe and discuss the associations between predictors. Moreover, a figure showing the relationship between percentage of variance explained by different class of predictors (regression models) is reported (Figure 3, page 91). All statistical analyses of this phase were performed using SPSS v. 23.0 (SPSS Inc., Chicago, IL, USA).

3.4. Results

Socio-demographic variables: Firstly, a Pearson Correlations matrix among the main Socio-demographic variables studied was run (Table 8, page 86) to explore the presence of significant associations with Sexual Desire. Based on these results, on the pilot, and on the literature evidences, 6 variables out of 10 were selected and controlled on the following steps, due to the possible confounding effects on sexual desire. “Age”, “Relational Status”, “Desire of Having a Baby”, “Educational Level”, “Drugs Use” and “Sexual Problems” were selected in this phase and were evaluated with a multiple regression using level of Sexual Desire (IIEF) as the dependent variable

(Table 9, Step 1). A significant model was shown ($F_{(6,442)}$=3.733; p<.001; R^2=.048). Using the Bonferroni correction (p<.008), the emerging predictor "Sexual Problems" indicating that men claiming for sexual complaints on the last 6 months reported significant lower levels of Sexual Desire. This model was used as a first step (covariates) for all the following Hierarchical Multiple Regressions.

Quality of Life (QoL): was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.1). Differently from Study 1, also two additional sub-scales of the SF-36 (Health Change and General Health) were considered to have a deeper view on this important issue. A significant model was shown ($F_{(15,427)}$=1.884; p<.05; ΔR^2=.017). Using the Bonferroni correction (p<.003), the covariate "Sexual Problems" was significant, indicating that men with sexual concerns in the last 6 months reported lower desire levels (the effect of the covariate is stronger than any sub-scale of QoL evaluated).

Psychopathological Symptoms: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.2). A significant model was revealed ($F_{(15,428)}$=2.258; p<.005; ΔR^2=.022). Using the Bonferroni correction (p<.003), the predictor "Depression" was the single significant, indicating that a higher presence of depressive symptoms was associated with lower Sexual Desire.

Emotional Response: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.3). A significant model was revealed ($F_{(8,384)}$=6.938; p<.001; ΔR^2=.135). Using the Bonferroni correction (p<.006), the predictor "Positive Affect" was significant, indicating that a higher presence of positive emotions about sexuality was associated with a higher level of Sexual Desire. Deepening this result, we wanted to know which positive emotion had a stronger association with Sexual Desire. A Hierarchical Multiple Regression including all the positive emotions assessed with PANAS was run. The analysis revealed a significant model ($F_{(16,422)}$=5.33; p<.001; ΔR^2=.197). Using the Bonferroni correction (p<.003), the

predictor “Strong” was significant, indicating that a major experience of this emotion about sexuality was associated with a higher level of Sexual Desire.

Alexithymia: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.4). A significant model was shown ($F_{(9,438)}$=3.085; p<.001; ΔR^2=.010), but using the Bonferroni correction (p<.006), no factor was significant.

Sexual Functioning: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.5). A significant model was shown ($F_{(10,438)}$=10.742; p<.001; ΔR^2=.149). Using the Bonferroni correction (p<.005), the factor “Orgasmic Function” was significant indicating that a better orgasm experience was associated with a higher level of Sexual Desire.

Premature Ejaculation Severity: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.6). A significant model was reported ($F_{(7,405)}$=3.407; p<.01; ΔR^2=.033). Using the Bonferroni correction (p<.007), the predictor “Premature Ejaculation Severity” was significant, indicating that a higher level of severity was associated with a lower level of Sexual Desire.

Sexual Satisfaction: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.7). A significant model was reported ($F_{(11,400)}$=5.032; p<.001; ΔR^2=.039). Using the Bonferroni correction (p<.005), only the covariate “Age” was significant, meaning that older men reported lower desire levels (the effect of the covariate is stronger than any sub-scale of sexual satisfaction evaluated).

Sexual Distress: was evaluated using level of Sexual Desire (IIEF) as dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.8). A significant model was reported ($F_{(7,441)}$=4.467; p<.001; ΔR^2=.018). Using the Bonferroni correction (p<.007), the predictor “Sexual Distress” was significant, indicating that a higher level of sexual distress was associated with a lower level of Sexual Desire.

Dyadic Adjustment: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.9). Only subjects having a relationship were considered for this analysis (n=280). A significant model was reported ($F_{(9,262)}$=3.229; p<.001; ΔR^2=.011). Using the Bonferroni correction (p<.006), no factor was significant.

Sexism: was evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.10). A significant model was reported ($F_{(8,391)}$=3.623; p<.001; ΔR^2=.022). Using the Bonferroni correction (p<.006), the predictor "Hostile Sexism" was significant, indicating that a higher presence of hostile beliefs towards women was associated with a higher level of Sexual Desire.

Negative Automatic Thoughts: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.11). A significant model was reported ($F_{(11,407)}$=7.385; p<.001; ΔR^2=.118). Using the Bonferroni correction (p<.005), the predictors "Erection Concern Thoughts (ECT)" and "Lack of Erotic Thoughts (LET)" were significant, indicating that a higher presence of erection concerns and a lower presence of erotic thoughts were associated with lower Sexual Desire.

Dysfunctional Sexual Beliefs: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.12). A significant model was reported ($F_{(9,423)}$=4.179; p<.001; ΔR^2=.027). Using the Bonferroni correction (p<.006), the covariate "Sexual Problems" and the predictor "Sexual Conservatism (SC)" were significant, indicating that a higher presence of conservative beliefs about sexuality and men with sexual concerns in the last 6 months were associated with lower level of Sexual Desire.

Cognitive Schemas Activated during Sexual Activity: were evaluated using level of Sexual Desire (IIEF) as the dependent variable and Socio-demographic variables as covariates (Table 9, Step 2.13). A significant model was reported ($F_{(8,422)}$=4.302; p<.01; ΔR^2=.022). Using the Bonferroni correction (p<.006), the covariate "Age" and the predictor "Helpless" were significant, indicating that

a higher involvement of cognitive schema such as feeling helpless or useless facing a stressful sexual situation and being "older" were associated with a lower level of Sexual Desire.

Main Predictors of Male Sexual Desire: According to the final aim of this study, that is evaluating the best predictors of male sexual desire, we conducted a Hierarchical Multiple Regression using level of Sexual Desire (IIEF) as the dependent variable with Socio-demographic variables as covariates (Table 10, page 89, Model 1), and using as predictors the factors found as significantly associated with Sexual Desire in the previous analyses (Depression, Positive Affect, Orgasmic Function, Premature Ejaculation Severity, Sexual Distress, Hostile Sexism, Erection Concerns Thoughts, Lack of Erotic Thoughts, Sexual Conservatism and Helpless) (Table 10, page 89, Model 2). The analysis revealed a significant general model which explained 33.5% of variance in Sexual Desire ($F_{(16,397)}$=13.193, p<.001, ΔR^2=.287). Using the Bonferroni correction (p<.003), "Orgasmic Function", "Erection Concern Thoughts (ECT)", "Lack of Erotic Thoughts (LET)", "Positive Affects" and "Hostile Sexism" were significant predictors. Moreover, "Orgasmic Function" was the best predictor of Sexual Desire.

3.5. Discussion

The aim of Study 2 was to deepen the investigation of the role of selected psychological and social factors on male sexual desire. Working from the foundation laid by the studies of Carvalho & Nobre (2011a; 2011b) and the pilot study presented in chapter 2, we increased the number of participants. The data showed a complex situation in which, once again, some predictors were not significantly associated with Sexual Desire in men or explained a very low percentage of variance (R^2).

Considering Socio-demographic variables, "Age" and presence of "Sexual Problems" were negatively associated with Sexual Desire. These relations are well established in literature and clinical practice for both biological causes and psychological consequences, with a negative effect on the overall sexual response (Hayes *et al*., 2007; McCabe *et al*., 2010; Simonelli *et al*., 2010; Corona *et*

al., 2013; 2015; DeLamater & Koepsel, 2014; Angst *et al*., 2015; Rosen *et al*., 2016). In line with the DSM-5 criteria, the presence of sexual complaints should be considered together with the personal distress. These factors resulted to be significantly associated (Table 11, page 90), suggesting that people with sexual difficulties and low distress did not necessarily report significant low sexual desire level, while men with high distress are associated to lower sexual drive scores (Hendrickx *et al*., 2014). Differently from the pilot study, the "Desire of Having a Child" was not shown as a significant predictor of sexual desire. This aspect could be explained by a different composition of the group (more numerous and a bit younger in this study compared with the pilot).

Differently from Study 1, the QoL did not show any significant predictor of Sexual Desire. In the Study 2, two new variables were considered for QoL (the subscales General Health and Health Change) to have a deeper view on this important issue. But the more predictors are considered, the more conservative is the statistics, increasing the rate of type II error. Also reproducing the analysis of the pilot (considering only the principal 6 sub-scales of the SF-36) in this group, QoL did not show any significant effect. Another important consideration regards the questionnaire: the SF-36 is a wide-used tool, but some scales are strongly related to the health status (Apolone & Mosconi, 1998). It is difficult to answer to some items in absence of significant clinical conditions. Probably contemplating different populations (e.g., people with sexual disorders or chronic illnesses) would show a different role of the Health-related QoL on sexual drive.

Considering psychological symptoms, the main predictor associated with low level of Sexual Desire was "Depression", as reported in Study 1. Our results have confirmed a direct relationship between depressive symptoms and low sexual desire (Bancroft *et al*., 2003a; 2003b; Basson *et al*., 2010; Khoo *et al*., 2010; Dinas *et al*., 2011; Carvalheira *et al*., 2014). As said in the previous discussions, there is still the need to further explore this aspect while searching for mediator variables or non-linear associations with sexual interest (given that depression and anxiety may be associated with both high and low levels of desire).

Considering alexithymia, no significant factor was revealed, in accordance with the pilot results. Our findings suggest that difficulty in processing emotions does not directly affect the ability to erotically fantasize. Meanwhile the association is strong with other male sexual problems such as ED and PE (Michetti *et al*., 2006; 2007; Simonelli *et al*., 2008). Regarding emotions triggered by sexual thoughts and situations, we also found a significant effect of Positive Affects (in particular, feeling "Strong") on Sexual Desire and a significant model explaining 13.50% of variance. Previous studies (Carvalho & Nobre, 2010; 2011) and the pilot showed a stronger association with negative feelings (fear, pain, and anger) in men. In these studies, SMQ-Emotional Response Scale was used, which presented a list of 8 negative emotions and just 2 positive ones. In more recent studies, PANAS was used instead of SMQ-Emotional Response Scale, presenting 10 items for positive affects and 10 for negative ones (Peixoto & Nobre, 2016; 2017). These researches showed an important protective role of positive emotions on sexual response, even stronger than negative feelings in some cases. Our results are in line with that, and the inclusion of PANAS, a more extensive and balanced tool than SMQ-Emotional Response Scale, could explain part of the evidence found. Resuming, sexual desire in men appears to be strongly influenced by emotions as well as for women, even if with some gender peculiarities. Men grow up dealing with strong stereotypic messages about machismo and virility, mainly based on "performance issues" (Masters *et al*., 2013; Sun *et al*., 2016). Men could be afraid of showing their sensibility and weakness, and this fear could lead to lower interest in being involved in sexual situations. It is not surprising that the main emotion emerged was feeling "Strong" about sexuality, as a representation of the strict connection between male sexuality, self-confidence and virility, previously highlighted in the famous study on sexual motivation by Meston & Buss (2007) as "having sex to feel powerful".

Sexual functioning showed a significant model explaining 14.90% of variance. Many studies (Fugl-Meyer & Sjogren, 1999; Sanchez-Cruz *et al*., 2003; Monga *et al*., 2004; Laumann *et al*., 2005; Carvalheira *et al*., 2014) have reported that general sexual function has an important impact on sexual desire, more in women than in men. In our data, the factors "Orgasmic Function" (measure of the

overall orgasmic experience) and "Premature Ejaculation Severity" (measure of both symptoms severity and distress) had a significant predictive role on sexual desire. In particular, a better orgasmic experience and a lower presence of PE symptomatology were associated with higher levels of Sexual Desire. To better understand these results, we should examine them in association with distress and satisfaction. Our data showed a significantly small role played by "Distress" (low percentage of explained variance), and no significant association with "Sexual Satisfaction". Recent studies have highlighted how distress negatively influences Sexual Desire (Dosch *et al*., 2016a; 2016b; Hendrickx *et al*., 2013; 2016) and sexual self-confidence (the way a person feels his/her ability to behave sexually) (Hendrickx *et al*., 2014; 2016). Previous research emphasised how men are focused more on sexual performance and partner judgement than personal sexual satisfaction (Purdon & Holdaway, 2006; Nobre & Pinto-Gouveia, 2008; Montorsi *et al*., 2010). These elements seem to suggest that personal satisfaction is less important in men than distress or sexual functioning in terms of affecting sexual drive.

Considering dyadic adjustment, no significant factor was revealed, confirming the pilot results. Literature describes relationship as a controversial factor in sexual interest: some research on men have focused on length of relationship (Klusmann, 2002; Murray & Milhausen, 2012) and others on couple satisfaction (Ridley *et al*., 2006; Bois *et al*., 2013; Carvalheira *et al*., 2014) as predictors of Sexual Desire. Other studies report that male desire is less affected by dyadic conflicts than women's one (Lachtar *et al*., 2006). These data were confirmed in Study 1, showing that the variables evaluated in DAS (Dyadic Consensus, Satisfaction, Cohesion and Affection) have no direct impact on Sexual Desire. Men desire seems to be triggered more by subjective variables (sexual function, distress, emotions, cognition and sexism) than relational ones.

Considering cultural aspects, the Hostile Sexism was revealed as one of the main predictors of sexual drive. This is a novel result: Hostile Sexism is a gender-based role division in which women perform the bulk of domestic duties and men express the dominant and virile role. In sexual behaviour, this stereotype is enriched by additional shades, like having elevated levels of sexual desire

and being always ready to have sex (Wood *et al*., 2006; Karakurt & Cumbie, 2012; Harris *et al*., 2016). Even if a strong association was shown, this result need to be confirmed in future studies.

Findings regarding negative automatic thoughts, dysfunctional beliefs and cognitive schemas activated in sexual contexts indicated that "Erection Concerns Thoughts", "Lack of Erotic Thoughts", "Sexual Conservatism", and "Helpless" were significant predictors of Sexual Desire. In particular, the negative automatic thoughts (measured by SMQ) explained a significant part of variance (11.80%). As first described by Carvalho & Nobre (2011a; 2011b), cognitive facets are closely connected with desire level and, in general, with sexual function. Moreover, the importance of attentional focus during sexual activity is clear: distracting thoughts are involved in generating and maintaining psychogenic erection problems (Both *et al*., 2011), and seem to have a central role in the interest process as well. Regarding "Sexual Conservatism", the idea that there is a normative sexual behaviour (the only legitimate), and every other sexual expression is wrong, perverted or weird could lead both to unrealistic expectations regarding sexuality/relationships and to develop sexual difficulties (Clarke *et al*., 2015). "Helpless" schema is referred to the idea of feeling personally powerless, weak, vulnerable, incompetent, inferior and without hope. Even in this case, the schema of feeling helpless is in clear contrast with the stereotypic idea of "a strong man expressing his power with a lively sexuality and drive" (Nobre & Pinto-Gouveia, 2009).

The final multiple regression analysis revealed the "Orgasmic Function", "Lack of Erotic Thoughts", "Erection Concerns Thoughts", "Hostile Sexism" and "Positive Affect" as the main predictors of males' Sexual Desire. The general model showed a large effect size accounting for 28.7% of variance in sexual interest (Cohen & Cohen, 2013). "Depression", "Premature Ejaculation Severity", "Sexual Distress", "Sexual Conservatism" and "Helpless" showed weaker effects. In accord with the BPS approach to sexuality, psychological and social factors are confirmed as having an important role on modulating Sexual Desire levels. These results highlight that sexual functioning, cognitive and emotive factors have a primary role in the male sexual interest process. Focusing on explained variance, the most relevant classes of factors for Sexual Desire are Sexual Functioning

(14.90%), Emotional Response (13.50%) and Negative Automatic Thoughts (11.80%). Other classes of factors seem to be comparatively of lower importance.

Findings from this study should be interpreted with caution due to some limitations. The protocol was composed of self-report questionnaires, some of which were translated scales (SDS, SSS) that have yet to be validated for the Italian language. Nevertheless, they were administrated in association with other validated measures (such as IIEF and DAS) to control for the lack of other measures' validity. In this second study, SMQ, SBDQ, and QCSASC were used in the Italian translated and validated versions.

Additionally, snowball sampling was used both for ease of reaching study volunteers and having more case variety; however, it leads to concerns regarding the generalization of the results. Our group, even if demonstrating a good variability, is not representative of the entire Italian male population and could better describe the cohort of young adults. To limit this bias, Socio-demographic variables were considered as covariates in all the analyses. Despite these limitations, the present study contributes to the current knowledge on the variables associated with male sexual desire and allowed us to make some considerations for the following studies.

Our main focus in this phase was to identify the best predictors of sexual desire in order to build, test and discuss some conceptual models. The next step of the project will be the construction of the Path Diagrams able to explain the relationships between the selected psychosocial factors (emerging from this study) and the male sexual desire referring to the BPS approach. Models are useful in research to resume and organize the outcomes. On the clinical side, a model is a guideline for the practitioner during the process of assessment, diagnosis and therapy; it usually helps to focus on some of the most relevant elements and to identify the relationship between the predisposing, precipitating and maintaining factors contributing to the onset and the development of sexual dysfunctions.

4. Study 3: Building and testing two psychosocial models of male sexual desire

4.1. Aims

The main objective of the Study 3 was to test the association between the best predictors found in Study 2 in two different causal models (Path Analysis) referring to the BPS approach (Figure 4, page 92).

Overall, the role of cognitive and emotional variables has been recognized in the context of male sexual dysfunctions (Corona *et al*., 2004; 2005; 2010; Carvalho & Nobre, 2011b). They are strongly related to the personal knowledge and life experience, but can be also promoted by more circumstantial conditions such as pathologies or unlucky events. Therefore, it would be important to clarify the interactive role between cognitive-emotional variables and other set of factors, such as sexual function and sexism on male sexual desire.

The connection between every sexual response phase has been well established for the female sexuality (Hartmann *et al*., 2004; Giles & McCabe, 2009), but having a direct connection between orgasm and desire in our data could support the same idea on male side.

Moreover, beliefs on stereotypes and gender roles testify the importance of "nurture" on our sexual behaviour, specifically on drive and motivation (Kozak *et al*., 2009; Erchull & Liss, 2014; Ramsey & Hoyt, 2014).

The aim of the present study was to test two conceptual models (full and partial mediation) considering the interrelated role of sexual function, sexism, and cognitive-emotional factors in male sexual desire. Two similar models were constructed: the dimensions included were selected according to both theoretical and empirical criteria, attending to previous studies of predictive factors of sexual desire in men (Study 1 and 2). The models will be described in detailed in the following paragraph (see "Participants and procedures", page 54). According to this integrative perspective, we

hypothesized that emotions and orgasmic function would have both a direct effect on drive and a partial mediating role (protective factors) between automatic thoughts in sexual context and desire in men. It was also predicted that sexism would have a direct effect only on sexual desire, justified by the absence of any correlation with the other variables considered (see Table 11, page 90).

4.2. Participants and procedures

Four hundred fifty heterosexual men from the general population were recruited. The data used for this study are the same collected for the Study 2 (see chapter 3, page 40).

In order to evaluate the implication of psychological and social factors on men's sexual desire, we proposed two models presenting causal directions among these factors. They are recursive models (unidirectional relationship between the variables), which does not invalidate the bidirectional nature that variables might logically assume referring to the BPS approach. The predictors Lack of Erotic Thoughts (LET), Erection Concern Thoughts (ECT), Positive Affect, Orgasmic Function and Hostile Sexism were selected as main variables of the two models, according to previous findings (Study 2). Age, Relational Status (coded as being or not in a couple), Desire of Having a Baby, Educational Level, Drugs Use, and Having or not a Sexual Problem in the last 6 months entered the models as covariates, in order to save our model as much as possible from confounding effects. In fact, having covariates will allow us to verify a general model, more precise and clear from the influence of age, relationship, and the other considered factors.

After the selection, variables were rearranged with paths considering not only their unique impact on sexual desire, but also how they interact among each other, affecting male sexual interest. Starting from the Cognitive-emotional model of sexual response (Nobre, 2009; 2010; Carvalho & Nobre, 2011b) and from the correlations among variables reported in chapter 3 (Table 11, page 90), the predictors selected for Path Analysis were LET and ECT (cognitive area – automatic thoughts). Positive Affects (emotions) and Orgasmic Function (sexual function) were located as endogenous

variables, depending on the cognitive aspects. Hostile Sexism (cultural area) was positioned as exogenous variable, as for Socio-demographic variables, considering its independence regarding other predictors (no correlation was showed by sexism with other considered variables). We expected the association of ECT and LET with Sexual Desire to be mediated by Orgasmic Function and Positive Affect. To test the validity of our hypothesis and the effect size of the mediation, two models were built and compared.

The Model 1 (Figure 5, page 93) was designed as a "full mediation model" from automatic thoughts to desire. ECT and LET were put as main predictors, with direct paths going from ECT to Positive Affect and from LET to Positive Affect and Orgasmic Function. Direct paths were drawn from emotions and orgasm to predict desire levels. This model means that all the effects of the cognitive variables pass through emotions and orgasmic phase. In other words, it is possible to contrast the negative effect of automatic thoughts (risk factors for HSDD) operating directly on positive emotions and sexual function, without considering the cognitive sphere.

Regarding Model 2 (Figure 6, page 94), it was designed as a "partial mediation model". Starting from Model 1, direct paths were added from ECT and LET to Sexual Desire in order to consider also their direct effects, not mediated by emotions and orgasm. In other words, part of ECT and LET effect is mediated by emotions and orgasm, and part directly influences Sexual Desire. This model explains the need to operate under an integrated approach, considering cognitive, emotional and sexual aspect all together in order to elicit an effective arise of sexual desire. In both models, Hostile Sexism and Socio-demographic variables were considered outside (exogenously), as external variables influencing Sexual Desire.

4.3. Data analysis

Path analysis, a statistical procedure used to test "causal" relationships and directions among predictors, was used to test two theoretical models about the interrelated role of psychosocial factors

on male sexual desire. Path Analyses were performed through Structural Equation Modelling (SEM) approach. SEM approach was chosen for testing and comparing the models (Iacobucci *et al*., 2007; Zhao *et al*., 2010). SEM compares favourably with usual regression-based approaches (Baron & Kenny, 1986) to mediation because it takes into account measurement error. Furthermore, it directly computes the extent and significance of the indirect effect, among other advantages (Iacobucci *et al*., 2007). Robust maximum likelihood estimation was used to limit issues due to normality violations. Scaled chi-square difference tests were used for models' comparisons (Bryant & Satorra, 2012). All statistical analyses of this phase were performed using IBM SPSS Amos v. 22 (SPSS Inc., Chicago, IL, USA).

4.4. Results

Firstly, a full mediation model was run (Model 1, Figure 5, page 93), and then tested whether allowing two direct paths from ECT and LET to Sexual Desire (Model 2, Figure 6, page 94, partial mediation model) increased the model fit. Considering a sample size of 450 subjects that could lower the power of chi-squared based analyses, the full mediation model provided a satisfactory fit to the data (χ^2=62.797, df=36, p=.004; GFI=.978; NFI=.902; CFI=.954; RMSEA=.041 [95% CI: .028 - .074]), as did the partial mediation model (χ^2=35.312, df=34, p=.406; GFI=.987; NFI=.945; CFI=.998; RMSEA=.009 [95% CI: .000 - .036]). However, the partial mediation model (Model 2) improved significantly the fit and was retained: $\Delta\chi^2$=27.485, Δdf=2, $p\leq$.000. As shown in Figure 6 (page 94), all the endogenous paths were found to be significant. Hostile Sexism, considered as exogenous variable, showed a significative effect on Sexual Desire. None of the Socio-demographic covariates was significant, even if it was important to have them included in the models, in order to control their possible confounding effects highlighted by previous studies.

The total effects of ECT and LET on Sexual Desire were respectively medium and large (ECT=-.178, p<.01; LET=-.290, p<.001). Regarding mediations, ECT was significantly indirectly connected

with Sexual Desire through the Positive Affect (indirect effect = -.022, p<.01). Positive Affect was found to partially mediate the ECT effect on Sexual Desire. LET was significantly indirectly connected with Sexual Desire through Positive Affect and Orgasmic Function (indirect effect = -.115, p<.001). Together, Positive Affect and Orgasmic Function showed a medium partial mediation of LET effect on Sexual Desire. Most of this indirect effect (.67, or 58%) was transmitted via Orgasmic Function. A smaller proportion of the effect (.48, or 42%) was mediated by Positive Affect, mainly because the emotions were less correlated to Sexual Desire than sexual functioning.

4.5. Discussions

The aim of the current study was to investigate the interrelated role among cognitive, emotional, sexual functioning and cultural factors in male sexual desire. The proposed conceptual model regarding psychosocial predictors of sexual desire in men showed the partial mediation role of positive emotions and orgasmic function in the relationship between cognitive predictors and sexual desire.

More specifically, it was found that the Erection Concerns Thoughts had a direct negative effect on Sexual Desire, partially mediated by Positive Affect. This pattern is consistent with previous studies that found a positive role of emotions on male sexual response (Nobre & Pinto-Gouveia, 2003; 2006a; 2006b; 2008; Janssen, 2011; Abdolmanafi *et al*., 2017). On the other side, Lack of Erotic Thoughts had a direct negative effect on Sexual Desire that was positively partially mediated by emotions and orgasmic function. This relationship is also consistent with literature on sexual functioning (Basson, 2002; Hartmann *et al*., 2004; Giles & McCabe, 2009). ECT and LET exerted also a significant direct effect on Sexual Desire, over and above the contribution of the other factors. This set of sexual thoughts supports the importance of cognitive distraction mechanisms during sexual intercourse (specifically related to poor sexual performance) as a process responsible for the decline of sexual response (Carvalho & Nobre, 2011b). Moreover, according to the present results, the role

of the attentional focus is not only involved in erectile dysfunction (Prause *et al*., 2008; Both *et al*., 2011; Nelson & Purdon, 2011; Oliveira *et al*., 2014), but also in reduced male sexual desire. In other words, the model verified affirms that, in order to attempt an increase of Sexual Desire, the role of positive emotions and sexual functioning (as protective factors) is not sufficient, but we should also deal directly with the cognitive facets (erection concerns and erotic fantasies).

The Model 2 is in line with both Cognitive-emotional model (Nobre, 2009; 2010; Carvalho & Nobre, 2011b) and the more extensive BPS model (Engel, 1977; 1980; Berry & Berry, 2013). In fact, it confirms the strong relationship between cognitive and affective spheres in sexual response, well established in several works (Nobre, 2009; 2010; Carvalho *et al*., 2013; Peixoto & Nobre, 2014; Pereira *et al*., 2016; 2017; Tavares *et al*., 2017), and it also implements the sexual functioning and the cultural perspective, often forgotten or marginalized in the taking care of sexual complaints. Specifically, the role played by sexual automatic thoughts and sexism testify how much male sexual behaviour is connected to male gender stereotypic ideas of "macho" and "virility" in the group studied. On one hand, male identity and sexuality (in particular desire) has been strongly related to the concepts of power, strength, performance, self-confidence, dominance, and also violence. On the other hand, the role of personal sexual pleasure has been often left apart in male sexuality, overshadowed by the stereotypic idea that a "real man" has to be strong and sex focused: the partner positive judgement on sexual performance is the main goal to achieve during sexual activity, and the quality of erection is the tool to score this goal (Purdon & Holdaway, 2006; Nobre & Pinto-Gouveia, 2008; Montorsi *et al*., 2010).

Having some socio-demographic variables (Age, Relational Status, Desire of Having a Baby, Educational Level, Drugs Use, and Sexual Problems) inside this model was very important, even if they did not show any significant direct effect on Sexual Desire. The wide range (18-76) and variability of participants reached (single, fathers, marred men, drug users, sexually clinical men, etc.) was retained in order to present a general model, able to summarize the main psychosocial effects on sexual desire. The model presented should be considered as a starting point to deepen with future

studies on selected populations. For example, is undeniable that drive in young men compared with elderly ones is extremely different, but some of the variables involved can be the same with peculiar weights (such as the ones highlighted in our model). The same discussion could be done for other groups, sexual orientations, clinical samples, etc.

For a clinical translation of these results, the automatic thoughts have been recognised as strong risk and maintaining factors for ED and HSDD (Nobre, 2009; 2010; Carvalho & Nobre, 2011b). The significant causal paths of the model confirmed the negative effect they can have on desire and on the orgasmic phase. Moreover, it is showed how positive emotions related to sexuality and orgasmic function are significant protective factors for sexual desire. Considering orgasm as an expression of healthy and satisfying sexual pleasure, the model showed how positive sexual experiences could influence male sexual response. In this sense, not only the cognitive rumination about adverse sexual situations (negative events such as the loss of erection during an intercourse or the impoverishment of erotic fantasies) can lower the desire in men, but also positive emotional experiences of pleasure seemed to have a considerable power to arise the desire and contrast the automatic thoughts (Simonelli *et al*., 2010; Peixoto & Nobre, 2016; 2017).

In clinical practice, this suggests the importance to enhance the pleasure feelings and expressions of sexual behaviour and to focus on the positive emotions endorsed in sexual and relational contests. Moreover, it is suggested to help the patient in the exploration of personal sexual pleasure, abandoning constraining ideas such as "performance", in order to increase the quality of sexual life and to be more able to deal with desire problems.

Finally, it should be recognized that findings from the present study have to be carefully interpreted due to several limitations. The role of physiological variables on sexual desire was not controlled. In addition, only experimental methodology would make possible the determination of causal relationships between the tested predictors. With reference to the proposed unidirectional model about sexual desire in men, it does not invalidate the circularity between variables that might result in bidirectional paths. Furthermore, the validity of recursive models like the two tested in this study

should be assessed by its replication in other studies with different populations (e.g., younger and older men, single and coupled, sexually healthy and clinical groups).

As said for the other studies of the current project, the snowball sampling was used both for easiness of reaching voluntary people and having more variety of cases; however, it leads to some problems with the generalization of the results. Compared with previous studies (Carvalho & Nobre 2011a; 2011b; Carvalheira *et al*., 2014; Dosch *et al*., 2015; 2016a; 2016b), we reach a bigger sample and analysed a wider range of factors, even if the variables are based exclusively on self-report validated measures, that are only partially able to capture the sexual behaviour phenomena.

Despite those limitations, findings suggest that cognitive, emotive, sexual functioning and cultural variables play a very important role on men's sexual interest.

Conclusion

The aim of the whole project was to investigate the role of selected psychosocial factors on male sexual desire. What was challenging in this project was the idea of studying many factors together, in order to have a broader view on sexual desire, wider than in previous research on this topic. This choice was guided by the attempt of following the BPS model, representing the "gold standard" approach in sexology and sexual medicine (Berry & Berry, 2013). This framework is capable to describe a complex network of direct effects and interactions between biological, psychological and cultural variables characterising a phenomenon.

Starting from the studies of Carvalho & Nobre (2011a; 2011b), we increased the number of factors analysed (such as QoL, alexithymia, sexism, sexual functioning, distress, and satisfaction). The current studies showed that not all the predictors considered were significantly associated with the level of sexual desire in male. The final multiple regression analysis revealed the "Orgasmic Function", the "Erection Concern Thoughts", the "Lack of Erotic Thoughts", the "Positive Affects" and the "Hostile Sexism" as the main predictors of male drive. After confronting two Path Diagrams, a causal model was presented in order to better understand how these variables work together in the arising/inhibition process of sexual desire. The desire towards a particular incentive is strengthened by its positive consequences such as orgasm and the lifting of emotional state. The system underlying sexual desire is constructed in such a way as to assimilate information from the social environment, in the form of imitation and reinforcement, which further undermines naïve dichotomies of the "nature versus nurture" kind, as shown by the cognitive and cultural elements interacting with emotions and sexual functioning in our final model.

But the issue of male sexual desire is far away from the end. What was presented in this project explained barely the 34% of variance in sexual desire (that is an excellent result for psychological

studies). On the other side, it means that there are two-thirds of variance that remains to be explained. Future studies should enclose some biological variables such as hormones level, dopamine and physical illnesses on sexual desire. In addition to that, our protocol was composed of only self-reported wide-used questionnaires and the sample was not representative. Next studies should improve the methodology, aiming to reach more representative groups and employing different kind of measures. Sexual desire can be best understood by taking both objective and subjective perspectives. Some features of desire are open to scientific investigation, whereas others are best explored by qualitative first-person insights. Another important point is to extend the study to different populations, such as other sexual orientations (e.g., gay and bisexual men) and sexually clinical men. Moreover, other important constructs should be considered as related to sexual desire such as the personality traits, emotional intelligence and the sexual inhibition/excitation paradigm of the Dual-control model (Bancroft & Janssen, 2000).

How sexual desire is understood has profound implications for how sexual behaviour is treated in ethical, medical, social, legal and religious contexts. It should be noted that the present project contributes to the current knowledge on the variables associated to male sexual desire, but the question is still open: in which way factors emerged are associated to level of desire? At the current state of the art, it is hard to establish if they are influenced by or are influencing sexual interest. Based only on data, it is not possible to determinate a precise direction of the effects, since the associations tested with regressions are linear and bidirectional. Starting from the Biopsychosocial approach, we successfully tested some causal models (Path Diagrams) that are useful to understand how the factors highlighted interact to determinate the levels of sexual desire. But these powerful statistics explain us only that our models are corrected; there could be other not-yet-tested models that could better fit the data.

Despite of this, the results presented are useful not only to deepen the understanding of male sexual response, but for their clinical applications. During the assessment phase, clinicians should explore fantasies, emotions, sexual functioning, sexual distress, depression symptoms, coping strategies,

stereotypical beliefs about masculinity and erection. These factors should be analysed and considered as predisposing, precipitating, maintaining, contextual, and protective factors. Moreover, assessing the protocol used in these studies could be helpful to better understand the weight of the interplaying variables in a clinical setting. In sexual therapy, psycho-sexologists should include tools able to identify and explore sexual fantasies, reflecting on the erotic imagery and stimulating a critical thinking and discussion about sexuality. Counteracting dysfunctional sexual beliefs and thoughts with sexual education could improve the consciousness on self-attitudes and limitations on sexuality, without forgetting the central role of emotions on male sexual response. Moreover, analysing the influence of other sexual problems (such as ED and PE) on desire and taking care of perceived distress is essential for the therapy process. Our findings show that male sexual desire is characterized by complex interactions between psychological and social elements that a good clinician should keep in mind while working towards the increase of patients' quality of life.

References

Abdolmanafi, A., Azadfallah, P., Fata, L., Winter, S., Farahani, H., Peixoto, M. M., & Nobre, P. (2017). Psychometric properties of the Iranian version of the Sexual Modes Questionnaire (SMQ): to assess the association between automatic thoughts, emotions and sexual response. *Sexual and Relationship Therapy*, 32(1), 102-121.

Althof, S. E., & Needle, R. B. (2011). Psychological factors associated with male sexual dysfunction: screening and treatment for the urologist. *Urologic Clinics of North America*, 38(2), 141-146.

Althof, S. E., Perelman, M. A., & Rosen, R. C. (2011). The Subjective Sexual Arousal Scale for Men (SSASM): Preliminary development and psychometric validation of a multidimensional measure of subjective male sexual arousal. *The Journal of Sexual Medicine*, 8(8), 2255-2268.

American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders (III ed.)*. Washington, DC: Author.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Washington, DC: Author.

Angst, J. (1998). Sexual problems in healthy and depressed persons. *International Clinical Psychopharmacology*, 13(4), S1-S4.

Angst, J., Hengartner, M. P., Rössler, W., Ajdacic-Gross, V., & Leeners, B. (2015). A Swiss Longitudinal Study of the Prevalence of, and Overlap Between, Sexual Problems in Men and Women Aged 20 to 50 Years Old. *The Journal of Sex Research*, 52(8), 949-959.

Ansong, K. S., & Punwaney, R. B. (1999). An assessment of the clinical relevance of serum testosterone level determination in the evaluation of men with low sexual drive. *The Journal of Urology*, 162(3), 719-721.

Apolone, G., & Mosconi, P. (1998). The Italian SF-36 Health Survey: translation, validation and norming. *Journal of Clinical Epidemiology*, 51(11), 1025-1036.

Atlantis, E., & Sullivan, T. (2012). Bidirectional association between depression and sexual dysfunction: A systematic review and meta-analysis. *The Journal of Sexual Medicine*, 9(6), 1497-1507.

Aumer, K. (2014). The influence of culture and gender on sexual self-schemas and satisfaction in romantic relationships. *Sexual and Relationship Therapy*, 29(3), 280-292.

Bagby, R. M., Parker, J. D., & Taylor, G. J. (1994a). The twenty-item Toronto Alexithymia Scale—I. Item selection and cross-validation of the factor structure. Journal of psychosomatic research, 38(1), 23-32.

Bagby, R. M., Taylor, G. J., & Parker, J. D. (1994b). The twenty-item Toronto Alexithymia Scale—II. Convergent, discriminant, and concurrent validity. Journal of psychosomatic research, 38(1), 33-40.

Baldwin, J. D., & Baldwin, J. I. (1997). Gender differences in sexual interest. *Archives of Sexual Behavior*, 26(2), 181-210.

Bancroft, J. (2005). The endocrinology of sexual arousal. *Journal of endocrinology*, 186(3), 411-427.

Bancroft, J. (2009). *Human sexuality and its problems*. Elsevier Health Sciences.

Bancroft, J., & Graham, C. A. (2011). The varied nature of women's sexuality: Unresolved issues and a theoretical approach. *Hormones and Behavior*, 59(5), 717-729.

Bancroft, J., & Janssen, E. (2000). The dual control model of male sexual response: A theoretical approach to centrally mediated erectile dysfunction. *Neuroscience & Biobehavioral Reviews*, 24(5), 571-579.

Bancroft, J., Janssen, E., Strong, D., Carnes, L., Vukadinovic, Z., & Long, J. S. (2003a). The relation between mood and sexuality in heterosexual men. *Archives of Sexual Behavior*, 32, 217–230.

Bancroft, J., Janssen, E., Strong, D., Vukadinovic, Z. (2003b). Relation between mood and sexuality in gay men. *Arch Sex Behav*,32, 231-42.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.

Basson, R. (2002). Women's sexual desire - Disordered or misunderstood? *Journal of Sex & Marital Therapy*, 28(1), 17-28.

Basson, R., & Schultz, W. W. (2007). Sexual sequelae of general medical disorders. *The Lancet*, 369(9559), 409-424.

Basson, R., Leiblum, S., Brotto, L., Derogatis, L., Fourcroy, J., Fugl-Meyer, K., ... & Schover, L. (2003). Definitions of women's sexual dysfunction reconsidered: Advocating expansion and revision. *Journal of Psychosomatic Obstetrics & Gynecology*, 24(4), 221-229.

Basson, R., Rees, P., Wang, R., Montejo, A. L., & Incrocci, L. (2010). Sexual function in chronic illness. *The Journal of Sexual Medicine*, 7(1pt2), 374-388.

Baumeister, R. F. (2004). Gender and erotic plasticity: Sociocultural influences on the sex drive. *Sexual and Relationship Therapy*, 19, 133-139.

Baumeister, R. F., Catanese, K. R., & Vohs, K. D. (2001). Is there a gender difference in strength of sex drive? Theoretical views, conceptual distinctions, and a review of relevant evidence. *Personality and social psychology review*, 5(3), 242-273.

Beck, A. T., Steer, R. A., Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.

Beck, J. G., & Bozman, A. W. (1995). Gender differences in sexual desire: The effects of anger and anxiety. *Archives of Sexual Behavior*, 24(6), 595-612.

Berry, M. D., & Berry, P. D. (2013). Contemporary treatment of sexual dysfunction: Reexamining the biopsychosocial model. *The Journal of Sexual Medicine*, 10(11), 2627-2643.

Bitzer, J., Giraldi, A., & Pfaus, J. (2013). Sexual desire and hypoactive sexual desire disorder in women. Introduction and overview. Standard operating procedure (SOP Part 1). *The Journal of Sexual Medicine*, 10(1), 36-49.

Boddi, V., Fanni, E., Castellini, G., Fisher, A. D., Corona, G., & Maggi, M. (2015). Conflicts within the family and within the couple as contextual factors in the determinism of male sexual dysfunction. *The Journal of Sexual Medicine*, 12(12), 2425-2435.

Bois, K., Bergeron, S., Rosen, N. O., McDuff, P., & Grégoire, C. (2013). Sexual and relationship intimacy among women with provoked vestibulodynia and their partners: Associations with sexual satisfaction, sexual function, and pain self-efficacy. *The Journal of Sexual Medicine*, 10(8), 2024-2035.

Both, S., Everaerd, W., & Laan, E. (2007). Desire emerges from excitement: A psychophysiological perspective on sexual motivation. *The psychophysiology of sex*, 327-339.

Both, S., Laan, E., & Everaerd, W. (2011). Focusing “hot” or focusing “cool”: Attentional mechanisms in sexual arousal in men and women. *The Journal of Sexual Medicine*, 8(1), 167-179.

Bressi, C., Taylor, G., Parker, J., Bressi, S., Brambilla, V., Aguglia, E., & Todarello, O. (1996). Cross validation of the factor structure of the 20-item Toronto Alexithymia Scale: an Italian multicenter study. *Journal of Psychosomatic Research*, 41(6), 551-559.

Brotto, L. A. (2010). The DSM diagnostic criteria for hypoactive sexual desire disorder in women. *Archives of Sexual Behavior*, 39(2), 221-239.

Bryant, F. B., & Satorra, A. (2012). Principles and practice of scaled difference chi-square testing. *Structural Equation Modeling: A Multidisciplinary Journal*, 19(3), 372-398.

Carvalheira, A. A., & Costa, P. A. (2015). The impact of relational factors on sexual satisfaction among heterosexual and homosexual men. *Sexual and Relationship Therapy*, 30(3), 314-324.

Carvalheira, A., Træen, B., & Štulhofer, A. (2014). Correlates of men's sexual interest: a cross-cultural study. *The Journal of Sexual Medicine*, 11(1), 154-164.

Carvalho, J., & Nobre, P. (2010). Gender issues and sexual desire: the role of emotional and relationship variables. *The Journal of Sexual Medicine*, 7(7), 2469-2478.

Carvalho, J., & Nobre, P. (2011a). Predictors of men's sexual desire: the role of psychological, cognitive-emotional, relational, and medical factors. *Journal of Sex Research*, 48(2-3), 254-262.

Carvalho, J., & Nobre, P. (2011b). Biopsychosocial determinants of men's sexual desire: Testing an integrative model. *The Journal of Sexual Medicine*, 8(3), 754-763.

Carvalho, J., Štulhofer, A., Vieira, A. L., & Jurin, T. (2015). Hypersexuality and high sexual desire: Exploring the structure of problematic sexuality. *The Journal of Sexual Medicine*, 12(6), 1356-1367.

Carvalho, J., Veríssimo, A., & Nobre, P. J. (2013). Cognitive and emotional determinants characterizing women with persistent genital arousal disorder. *The Journal of Sexual Medicine*, 10(6), 1549-1558.

Cheng, J. C., Burke, W. H., Fedoroff, J. P., & Dwyer, R. G. (2015). Neuroimaging and sexual behavior: identification of regional and functional differences. *Current Psychiatry Reports*, 17(7), 55.

Clarke, M. J., Marks, A. D., & Lykins, A. D. (2015). Effect of normative masculinity on males' dysfunctional sexual beliefs, sexual attitudes, and perceptions of sexual functioning. *The Journal of Sex Research*, 52(3), 327-337.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge.

Corona G., Tripodi F., Reisman Y., Maggi M. (2015). Hypoactive Sexual desire (libido) disorder. *The ESSM Manual of Sexual Medicine*. Amsterdam: Medix.

Corona, G., Baldi, E., & Maggi, M. (2011). Androgen regulation of prostate cancer: where are we now? *Journal of Endocrinological Investigation*, 34(3), 232-243.

Corona, G., Isidori, A. M., Aversa, A., Burnett, A. L., & Maggi, M. (2016). Endocrinologic control of men's sexual desire and arousal/erection. *The Journal of Sexual Medicine*, 13(3), 317-337.

Corona, G., Lee, D. M., Forti, G., O'connor, D. B., Maggi, M., O'neill, T. W., ... & Finn, J. D. (2010). Age-related changes in general and sexual health in middle-aged and older men: Results from the European Male Ageing Study (EMAS). *The Journal of Sexual Medicine*, 7(4pt1), 1362-1380.

Corona, G., Mannucci, E., Forti, G., & Maggi, M. (2009). Hypogonadism, ED, metabolic syndrome and obesity: a pathological link supporting cardiovascular diseases. *International Journal of Andrology*, 32(6), 587-598.

Corona, G., Mannucci, E., Petrone, L., Giommi, R., Mansani, R., Fei, L., Forti, G., & Maggi, M. (2004). Psycho-biological correlates of hypoactive sexual desire in patients with erectile dysfunction. *International Journal of Impotence Research*, 16(3), 275.

Corona, G., Petrone, L., Mannucci, E., Ricca, V., Balercia, G., Giommi, R., ... & Maggi, M. (2005). The impotent couple: Low desire. *International Journal of Andrology*, 28(s2), 46-52.

Corona, G., Rastrelli, G., Ricca, V., Jannini, E. A., Vignozzi, L., Monami, M., & Maggi, M. (2013). Risk factors associated with primary and secondary reduced libido in male patients with sexual dysfunction. *The Journal of Sexual Medicine*, 10(4), 1074-1089.

DeLamater, J., & Koepsel, E. (2015). Relationships and sexual expression in later life: a biopsychosocial perspective. *Sexual and Relationship Therapy*, 30(1), 37-59.

DeLamater, J. D., Weinfurt, K. P., & Flynn, K. E. (2017). Patients' Conceptions of Terms Related to Sexual Interest, Desire, and Arousal. *The Journal of Sexual Medicine*, 14, 1327-35.

Derogatis L. R. (1994). *Symptom Checklist-90-R: administration, scoring and procedures manual, 3rd ed*. Minneapolis: National Computer Systems.

Derogatis, L. R., Rosen, R., Leiblum, S., Burnett, A., & Heiman, J. (2002). The Female Sexual Distress Scale (FSDS): Initial validation of a standardized scale for assessment of sexually related personal distress in women. *Journal of Sex & Marital Therapy*, 28(4), 317-330.

Derogatis, L., Rosen, R. C., Goldstein, I., Werneburg, B., Kempthorne-Rawson, J., & Sand, M. (2012). Characterization of hypoactive sexual desire disorder (HSDD) in men. *The Journal of Sexual Medicine*, 9(3), 812-820.

Dinas, P. C., Koutedakis, Y., & Flouris, A. D. (2011). Effects of exercise and physical activity on depression. *Irish Journal of Medical Science*, 180(2), 319-325.

Dosch, A., Belayachi, S., & Van der Linden, M. (2016a). Implicit and explicit sexual attitudes: how are they related to sexual desire and sexual satisfaction in men and women? *The Journal of Sex Research*, 53(2), 251-264.

Dosch, A., Rochat, L., Ghisletta, P., Favez, N., & Van der Linden, M. (2015). Psychological factors involved in sexual desire, sexual activity, and sexual satisfaction: A multi-factorial perspective. *Archives of Sexual Behavior*, 1-17.

Dosch, A., Rochat, L., Ghisletta, P., Favez, N., & Van der Linden, M. (2016b). Psychological factors involved in sexual desire, sexual activity, and sexual satisfaction: A multi-factorial perspective. *Archives of Sexual Behavior*, 45(8), 2029-2045.

Ellison, C. R. (2001). Intimacy-based sex therapy: Sexual choreography. *New directions in sex therapy: Innovations and alternatives*, 163-184.

Emmelot-Vonk, M. H., Verhaar, H. J. J., Nakhai-Pour, H. R., Grobbee, D. E., & Van Der Schouw, Y. T. (2009). Effect of testosterone supplementation on sexual functioning in aging men: a 6-month randomized controlled trial. *International Journal of Impotence Research*, 21(2), 129-138.

Engel, G. L. (1977). The need for a new medical model: a challenge for biomedicine. *Science*, 196, 129-36.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *Am J Psychiatry*, 137(5), 535-544.

Erchull, M. J., & Liss, M. (2014). The object of one's desire: How perceived sexual empowerment through objectification is related to sexual outcomes. *Sexuality & Culture*, 18(4), 773-788.

Ferreira, L. C., Fraenkel, P., Narciso, I., & Novo, R. (2015). Is committed desire intentional? A qualitative exploration of sexual desire and differentiation of self in couples. *Family process*, 54(2), 308-326.

Fugl-Meyer, A., & Sjogren, K. (1999). Sexual disabilities, problems and satisfaction in 18-74 year old Swedes. *Scand J Sexol*, 2, 79.

Gades, N. M., Jacobson, D. J., McGree, M. E., St Sauver, J. L., Lieber, M. M., Nehra, A., ... & Jacobsen, S. J. (2008). The associations between serum sex hormones, erectile function, and sex drive: the Olmsted County Study of Urinary Symptoms and Health Status among Men. *The Journal of Sexual Medicine*, 5(9), 2209-2220.

Giles, K. R., & McCabe, M. P. (2009). WOMEN'S SEXUAL HEALTH: Conceptualizing Women's Sexual Function: Linear vs. Circular Models of Sexual Response. *The Journal of Sexual Medicine*, 6(10), 2761-2771.

Giraldi, A., Kristensen, E., & Sand, M. (2015). Endorsement of models describing sexual response of men and women with a sexual partner: an online survey in a population sample of Danish adults ages 20–65 years. *The Journal of Sexual Medicine*, 12(1), 116-128.

Gledhill, S., & Schweitzer, R. D. (2014). Sexual desire, erectile dysfunction and the biomedicalization of sex in older heterosexual men. *Journal of Advanced Nursing*, 70(4), 894-903.

Glick, P., & Fiske, S. T. (1996). The ambivalent sexism inventory: differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology*, 70(3), 491-512.

Goldstein, I. (2012). Sexual medicine reflects the light of knowledge. *The Journal of Sexual Medicine*, 9(11), 2733-2735.

Grøntvedt, T. V., Kennair, L. E. O., & Mehmetoglu, M. (2015). Factors predicting the probability of initiating sexual intercourse by context and sex. *Scandinavian Journal of Psychology*, 56(5), 516-526.

Hakim, C. (2015). The male sexual deficit: A social fact of the 21st century. *International Sociology*, 30(3), 314-335.

Harris, E. A., Hornsey, M. J., & Barlow, F. K. (2016). On the link between benevolent sexism and orgasm frequency in heterosexual women. *Archives of Sexual Behavior*, 45(8), 1923-1931.

Hartmann, U. (2007). Depression and sexual dysfunction. *Journal of Men's Health and Gender*, 4(1), 18-25.

Hartmann, U., Philippsohn, S., Heiser, K., & Rüffer-Hesse, C. (2004). Low sexual desire in midlife and older women: personality factors, psychosocial development, present sexuality. *Menopause*, 11(6, Part 2 of 2), 726-740.

Hawkes, G. (2004). *Sex and Pleasure in Western Culture*. Cambridge: Polity Press.

Hayes, R. D., Dennerstein, L., Bennett, C. M., Koochaki, P. E., Leiblum, S. R., & Graziottin, A. (2007). Relationship between hypoactive sexual desire disorder and aging. *Fertility and Sterility*, 87(1), 107-112.

Hendrickx, L., Gijs, L., & Enzlin, P. (2013). Distress, sexual dysfunctions, and DSM: Dialogue at cross purposes? *The Journal of Sexual Medicine*, 10(3), 630-641.

Hendrickx, L., Gijs, L., & Enzlin, P. (2014). Prevalence rates of sexual difficulties and associated distress in heterosexual men and women: Results from an Internet survey in Flanders. *Journal of Sex Research*, 51(1), 1-12.

Hendrickx, L., Gijs, L., Janssen, E., & Enzlin, P. (2016). Predictors of Sexual Distress in Women With Desire and Arousal Difficulties: Distinguishing Between Personal, Partner, and Interpersonal Distress. *The Journal of Sexual Medicine*, 13(11), 1662-1675.

Hurlbert, D. F., Apt, C., Hurlbert, M. K., & Pierce, A. P. (2000). Sexual compatibility and the sexual desire-motivation relation in females with hypoactive sexual desire disorder. *Behavior Modification*, 24(3), 325-347.

Hyde, J. S. (2005). The gender similarities hypothesis. *American psychologist*, 60(6), 581-592.

Hyde, J. S. (2007). New directions in the study of gender similarities and differences. *Current Directions in Psychological Science*, 16(5), 259-263.

Iacobucci, D., Saldanha, N., & Deng, X. (2007). A meditation on mediation: Evidence that structural equations models perform better than regressions. *Journal of Consumer Psychology*, 17(2), 139-153.

ISTAT - Istituto Nazionale di Statistica (2011). *15° Censimento della popolazione e delle abitazioni 2011*. Available online at: http://www.istat.it/it/censimento-popolazione/censimento-popolazione-2011.

Jannini, E. A., McCabe, M. P., Salonia, A., Montorsi, F., & Sachs, B. D. (2010). Controversies in sexual medicine: Organic vs. psychogenic? The Manichean diagnosis in sexual medicine. *The Journal of Sexual Medicine*, 7(5), 1726-1733.

Janssen, E. (2011). Sexual arousal in men: A review and conceptual analysis. *Hormones and Behavior*, 59(5), 708-716.

Janssen, E., & Bancroft, J. (2007). The dual-control model: The role of sexual inhibition and excitation in sexual arousal and behavior. *The Psychophysiology of Sex*, 15, 197-222.

Janssen, E., McBride, K. R., Yarber, W., Hill, B. J., & Butler, S. M. (2008). Factors that influence sexual arousal in men: A focus group study. *Archives of Sexual Behavior*, 37(2), 252-265.

Kafka, M. P. (2010). Hypersexual disorder: A proposed diagnosis for DSM-V. *Archives of Sexual Behavior*, 39(2), 377-400.

Kaplan, H. S. (1974). *The new sex therapy*. New York: Brunner/Mazel.

Kaplan, H. S. (1979). *Disorders of sexual desire*. New York: Brunner/Mazel.

Karakurt, G., & Cumbie, T. (2012). The relationship between egalitarianism, dominance, and violence in intimate relationships. *Journal of Family Violence*, 27(2), 115-122.

Katz, A., & Dizon, D. S. (2016). Sexuality after cancer: a model for male survivors. *The Journal of Sexual Medicine*, 13(1), 70-78.

Khoo, J., Piantadosi, C., Worthley, S., & Wittert, G. A. (2010). Effects of a low-energy diet on sexual function and lower urinary tract symptoms in obese men. *International Journal of Obesity*, 34(9), 1396.

Kirana, P. S., Tripodi, F., Reisman, Y., & Porst, H. (2013). *The EFS and ESSM syllabus of clinical sexology*. Amsterdam: Medix 2013.

Klusmann, D. (2002). Sexual motivation and the duration of partnership. *Archives of Sexual Behavior*, 31(3), 275-287.

Kozak, M., Frankenhauser, H., & Roberts, T. A. (2009). Objects of desire: Objectification as a function of male sexual orientation. *Psychology of Men & Masculinity*, 10(3), 225.

Laan, E., & Both, S. (2008). What makes women experience desire? *Feminism & Psychology*, 18(4), 505-514.

Lachtar, C., Lachtar, F., & Jarraya, A. (2006). Sexual desire in Tunisian conjugal couple: Particularities and maintenance factors. *Annales Médico-Psychologiques*, 164, 402-409.

Lau, J. T. F., Kim, J. H., & Tsui, H. Y. (2005). Prevalence of male and female sexual problems, perceptions related to sex and association with quality of life in a Chinese population: a population-based study. *International Journal of Impotence Research*, 17(6), 494.

Laumann, E. O., Nicolosi, A., Glasser, D. B., Paik, A., Gingell, C., Moreira, E., & Wang, T. (2005). Sexual problems among women and men aged 40-80 y: prevalence and correlates identified in the Global Study of Sexual Attitudes and Behaviors. *International Journal of Impotence Research*, 17(1), 39.

Laumann, E. O., Paik, A., & Rosen, R. C. (1999). Sexual dysfunction in the United States: prevalence and predictors. *Jama*, 281(6), 537-544.

Laurent, S. M., & Simons, A. D. (2009). Sexual dysfunction in depression and anxiety: conceptualizing sexual dysfunction as part of an internalizing dimension. *Clinical Psychology Review*, 29(7), 573-585.

Lenzi, A., Lombardo, F., Salacone, P., Gandini, L., & Jannini, E. A. (2003). Stress, sexual dysfunctions, and male infertility. *Journal of Endocrinological Investigation*, 26(3 Suppl), 72-76.

Levine, S. B. (1987). More on the nature of sexual desire. *Journal of Sex & Marital Therapy*, 13(1), 35-44.

Levine, S. B. (2002). Reexploring the concept of sexual desire. *Journal of Sex &Marital Therapy*, 28(1), 39-51.

Levine, S. B. (2003). The nature of sexual desire: A clinician's perspective. *Archives of Sexual Behavior*, 32(3), 279-285.

Levine, S. B. (2010). Hypoactive sexual desire disorder in men: basic types, causes, and treatment. *Psychiatric Times*, 1, 40-5.

Lewis, R. W., Fugl-Meyer, K. S., Corona, G., Hayes, R. D., Laumann, E. O., Moreira Jr, E. D., & Segraves, T. (2010). Definitions/epidemiology/risk factors for sexual dysfunction. *The Journal of Sexual Medicine*, 7(4pt2), 1598-1607.

Lue, T. F., Basson, R., Rosen, R., Giuliano, F., Khoury, S., & Montorsi, F. (2004). *Sexual medicine: Sexual dysfunctions in men and women*. Distributor ed, 21.

Lykins, A. D., Janssen, E., & Graham, C. A. (2006). The relationship between negative mood and sexuality in heterosexual college women and men. *Journal of Sex Research*, 43(2), 136-143.

Madioni, F., & Mammana, L. A. (2001). Toronto Alexithymia Scale in outpatients with sexual disorders. *Psychopathology*, 34(2), 95-98.

Mark, K. P. (2012). The relative impact of individual sexual desire and couple desire discrepancy on satisfaction in heterosexual couples. *Sexual and Relationship Therapy*, 27(2), 133-146.

Mark, K. P., & Murray, S. H. (2012). Gender differences in desire discrepancy as a predictor of sexual and relationship satisfaction in a college sample of heterosexual romantic relationships. *Journal of Sex & Marital Therapy*, 38(2), 198-215.

Mark, K., Herbenick, D., Fortenberry, D., Sanders, S., & Reece, M. (2014). The object of sexual desire: examining the "what" in "what do you desire?". *The Journal of Sexual Medicine*, 11(11), 2709-2719.

Martin, S. A., Atlantis, E., Lange, K., Taylor, A. W., O'loughlin, P., & Wittert, G. A. (2014). Predictors of sexual dysfunction incidence and remission in men. *The Journal of Sexual Medicine*, 11(5), 1136-1147.

Masters, N. T., Casey, E., Wells, E. A., & Morrison, D. M. (2013). Sexual scripts among young heterosexually active men and women: Continuity and change. *Journal of Sex Research*, 50(5), 409-420.

McCabe, M. P., & Connaughton, C. (2014). Psychosocial factors associated with male sexual difficulties. *Journal of Sex Research*, 51(1), 31-42.

McCabe, M. P., Sharlip, I. D., Atalla, E., Balon, R., Fisher, A. D., Laumann, E., ... & Segraves, R. T. (2016). Definitions of sexual dysfunctions in women and men: a consensus statement from the Fourth International Consultation on Sexual Medicine 2015. *The Journal of Sexual Medicine*, 13(2), 135-143.

McCabe, M., Althof, S. E., Assalian, P., Chevret-Measson, M., Leiblum, S. R., Simonelli, C., & Wylie, K. (2010). Psychological and interpersonal dimensions of sexual function and dysfunction. *The Journal of Sexual Medicine*, 7(1pt2), 327-336.

McCarthy, B., & McDonald, D. (2009). Sex therapy failures: a crucial, yet ignored, issue. *Journal of Sex & Marital Therapy*, 35(4), 320-329.

McNicholas, T. A., Dean, J. D., Mulder, H., Carnegie, C., & Jones, N. A. (2003). A novel testosterone gel formulation normalizes androgen levels in hypogonadal men, with improvements in body composition and sexual function. *BJU International*, 91(1), 69-74.

Meana, M. (2010). Elucidating women's (hetero) sexual desire: Definitional challenges and content expansion. *Journal of Sex Research*, 47(2-3), 104-122.

Mercer, C. H., Fenton, K. A., Johnson, A. M., Wellings, K., Macdowall, W., McManus, S., ... & Erens, B. (2003). Sexual function problems and help seeking behaviour in Britain: national probability sample survey. *Bmj*, 327(7412), 426-427.

Meston, C. M., & Buss, D. M. (2007). Why humans have sex. *Archives of Sexual Behavior*, 36(4), 477-507.

Meston, C., & Trapnell, P. (2005). Development and validation of a five-factor sexual satisfaction and distress scale for women: The Sexual Satisfaction Scale for Women (SSS-W). *The Journal of Sexual Medicine*, 2(1), 66-81.

Metz, M. E., & McCarthy, B. W. (2003). *Coping with premature ejaculation: How to overcome PE, please your partner & have great sex.* New Harbinger Publications Incorporated.

Michael, A., & O'Keane, V. (2000). Sexual dysfunction in depression. *Human Psychopharmacology: Clinical and Experimental*, 15(5), 337-345.

Michetti, P. M., Rossi, R., Bonanno, D., De Dominicis, C., Iori, F., & Simonelli, C. (2007). Dysregulation of emotions and premature ejaculation (PE): alexithymia in 100 outpatients. *The Journal of Sexual Medicine*, 4(5), 1462-1467.

Michetti, P. M., Rossi, R., Bonanno, D., Tiesi, A., & Simonelli, C. (2006). Male sexuality and regulation of emotions: A study on the association between alexithymia and erectile dysfunction (ED). *International Journal of Impotence Research*, 18(2), 170-174.

Mitchell, K. R., Wellings, K. A., & Graham, C. (2014). How do men and women define sexual desire and sexual arousal? *Journal of Sex & Marital Therapy*, 40(1), 17-32.

Monga, M., Alexandrescu, B., Katz, S. E., Stein, M., & Ganiats, T. (2004). Impact of infertility on quality of life, marital adjustment, and sexual function. *Urology*, 63(1), 126-130.

Montorsi, F., Pierce, C. J., & Khoury, S. (2010). FOREWORD: The Third International Consultation on Sexual Medicine: Advancing Science in the Interest of Patient Care. *The Journal of Sexual Medicine*, 7(1pt2), 312-313.

Morton, H., & Gorzalka, B. B. (2013). Cognitive aspects of sexual functioning: Differences between East Asian-Canadian and Euro-Canadian women. *Archives of Sexual Behavior*, 42(8), 1615-1625.

Murray, S. H., & Milhausen, R. R. (2012). Sexual desire and relationship duration in young men and women. *Journal of Sex & Marital Therapy*, 38(1), 28-40.

Murray, S. H., Milhausen, R. R., Graham, C. A., & Kuczynski, L. (2017). A qualitative exploration of factors that affect sexual desire among men aged 30 to 65 in long-term relationships. *The Journal of Sex Research*, 54(3), 319-330.

Najman, J. M., Dunne, M. P., Purdie, D. M., Boyle, F. M., & Coxeter, P. D. (2005). Sexual abuse in childhood and sexual dysfunction in adulthood: An Australian population-based study. *Archives of Sexual Behavior*, 34(5), 517-526.

Neculaesei, A. N. (2015). Culture and Gender Role Differences. *CrossCultural Management Journal*, (7), 31-35.

Nelson, A. L., & Purdon, C. (2011). Non-erotic thoughts, attentional focus, and sexual problems in a community sample. *Archives of Sexual Behavior*, 40(2), 395-406.

Nimbi, F. M., Tripodi, F., Simonelli, C., Nobre, P. (*under review*). Sexual Dysfunctional Beliefs Questionnaire (SDBQ): Italian validation study.

Nimbi, F. M., Tripodi, F., Simonelli, C., Nobre, P. (2018). Sexual Modes Questionnaire (SMQ): Italian validation study of the Automatic Thought scale. *Journal of Sexual Medicine, in publication.*

Nimbi, F. M., Tripodi, F., Simonelli, C., Nobre, P. (*under review*). Questionnaire of Cognitive Schema Activation in Sexual Context (QCSASC): Italian validation study.

Nobre, P. J. (2009). Determinants of sexual desire problems in women: Testing a cognitive-emotional model. *Journal of Sex & Marital Therapy*, 35(5), 360-377.

Nobre, P. J. (2010). Psychological determinants of erectile dysfunction: testing a cognitive-emotional model. *The Journal of Sexual Medicine*, 7(4pt1), 1429-1437.

Nobre, P. J., & Pinto-Gouveia, J. (2000). Erectile dysfunctions: An empirical approach based on Beck's cognitive theory. *Sexual and Relationship Therapy*, 15, 351-366.

Nobre, P. J., & Pinto-Gouveia, J. (2003). Sexual Modes Questionnaire: Measure to assess the interaction among cognitions, emotions, and sexual response. *Journal of Sex Research*, 40(4), 368-382.

Nobre, P. J., & Pinto-Gouveia, J. (2006a). Dysfunctional sexual beliefs as vulnerability factors for sexual dysfunction. *Journal of Sex Research*, 43, 68-75.

Nobre, P. J., & Pinto-Gouveia, J. (2006b). Emotions during sexual activity: Differences between sexually functional and dysfunctional men and women. *Archives of Sexual Behavior*, 35, 8-15.

Nobre, P. J., & Pinto-Gouveia, J. (2008). Differences in automatic thoughts presented during sexual activity between sexually functional and dysfunctional men and women. *Cognitive Therapy and Research*, 32, 37-49.

Nobre, P. J., & Pinto-Gouveia, J. (2009). Cognitive schemas associated with negative sexual events: A comparison of men and women with and without sexual dysfunction. *Archives of Sexual Behavior*, 38(5), 842-851.

Nobre, P. J., Pinto-Gouveia, J., & Gomes, F. A. (2003). Sexual Dysfunctional Beliefs Questionnaire: An instrument to assess sexual dysfunctional beliefs as vulnerability factors to sexual problems. *Sexual and Relationship Therapy*, 18(2), 101-135.

Oliveira, C., Laja, P., Carvalho, J., Quinta Gomes, A., Vilarinho, S., Janssen, E., & Nobre, P. J. (2014). Predictors of Men's Sexual Response to Erotic Film Stimuli: The Role of Affect and Self-Reported Thoughts. *The Journal of Sexual Medicine*, 11(11), 2701-2708.

Ozkan, B., Orhan, E., Aktas, N., & Coskuner, E. R. (2015). Depression and sexual dysfunction in Turkish men diagnosed with infertility. *Urology*, 85(6), 1389-1393.

Parish, S. J., & Hahn, S. R. (2016). The Epidemiology and Diagnosis of Hypoactive Sexual Desire Disorder and Causes of HSDD: Situational, Depression, Drugs, Chronic Illnesses, and Hormonal Depletion. In *Management of Sexual Dysfunction in Men and Women* (pp. 223-232). Springer New York.

Pastuszak, A. W., Badhiwala, N., Lipshultz, L. I., & Khera, M. (2013). Depression is correlated with the psychological and physical aspects of sexual dysfunction in men. *International Journal of Impotence Research*, 25(5), 194.

Paterson, L. Q., Jin, E. S., Amsel, R., & Binik, Y. M. (2014). Gender similarities and differences in sexual arousal, desire, and orgasmic pleasure in the laboratory. *The Journal of Sex Research*, 51(7), 801-813.

Pedersen, M. B., Giraldi, A., Kristensen, E., Lauritzen, T., Sandbæk, A., & Charles, M. (2015). Prevalence of sexual desire and satisfaction among patients with screen-detected diabetes and impact of intensive multifactorial treatment: Results from the ADDITION-Denmark study. *Scandinavian Journal of Primary Health Care*, 33(1), 3-10.

Peixoto, M. M., & Nobre, P. (2014). Dysfunctional sexual beliefs: a comparative study of heterosexual men and women, gay men, and lesbian women with and without sexual problems. *The Journal of Sexual Medicine*, 11(11), 2690-2700.

Peixoto, M. M., & Nobre, P. (2016). Positive and negative affect during sexual activity: differences between homosexual and heterosexual men and women, with and without sexual problems. *Journal of sex & marital therapy*, 42(1), 4-17.

Peixoto, M. M., & Nobre, P. (2017). Incompetence Schemas and Sexual Functioning in Heterosexual and Lesbian Women: The Mediator Role of Automatic Thoughts and Affective States During Sexual Activity. *Cognitive Therapy and Research*, 41(2), 1-9.

Pereira, R., Margarida Oliveira, C., & Nobre, P. (2016). Sexual functioning and cognitions during sexual activity in men with genital pain: a comparative study. *Journal of Sex & Marital Therapy*, 42(7), 602-615.

Pereira, R., Oliveira, C., & Nobre, P. J. (2017). Cognitive Factors and Male Genital Pain: A Preliminary Study. *International Journal of Sexual Health*, 29(2), 202-210.

Piva, I., Lo Monte, G., Graziano, A., & Marci, R. (2014). A literature review on the relationship between infertility and sexual dysfunction: Does fun end with baby making? *The European Journal of Contraception & Reproductive Health Care*, 19(4), 231-237.

Prause, N., Janssen, E., & Hetrick, W. P. (2008). Attention and emotional responses to sexual stimuli and their relationship to sexual desire. *Archives of Sexual Behavior*, 37(6), 934-949.

Prunas, A., Sarno, I., Preti, E., Madeddu, F., & Perugini, M. (2012). Psychometric properties of the Italian version of the SCL-90-R: a study on a large community sample. *European Psychiatry*, 27(8), 591-597.

Purdon, C., & Holdaway, L. (2006). Non-erotic thoughts: Content and relation to sexual functioning and sexual satisfaction. *Journal of Sex Research*, 43, 154-162.

Puts, D. A., Pope, L. E., Hill, A. K., Cárdenas, R. A., Welling, L. L., Wheatley, J. R., & Breedlove, S. M. (2015). Fulfilling desire: Evidence for negative feedback between men's testosterone, sociosexual psychology, and sexual partner number. *Hormones and behavior*, 70, 14-21.

Rajkumar, R. P., & Kumaran, A. K. (2015). Depression and anxiety in men with sexual dysfunction: a retrospective study. *Comprehensive psychiatry*, 60, 114-118.

Ramezanzadeh, F., Aghssa, M. M., Jafarabadi, M., & Zayeri, F. (2006). Alterations of sexual desire and satisfaction in male partners of infertile couples. *Fertility and Sterility*, 85(1), 139-143.

Ramsey, L. R., & Hoyt, T. (2015). The object of desire: How being objectified creates sexual pressure for women in heterosexual relationships. *Psychology of Women Quarterly*, 39(2), 151-170.

Reisman, Y., Porst, H., Lowenstein, L., Tripodi, F., Kirana P.S. (2015). *The ESSM Manual of Sexual Medicine*. Amsterdam: Medix 2015.

Richardson, D., Goldmeier, D., Frize, G., Lamba, H., De Souza, C., Kocsis, A., & Scullard, G. (2007). Letrozole versus testosterone. A single-center pilot study of HIV-infected men who have sex with men on highly active anti-retroviral therapy (HAART) with hypoactive sexual desire disorder and raised estradiol levels. *The Journal of Sexual Medicine*, 4(2), 502-508.

Ridley, C. A., Cate, R. M., Collins, D. M., Reesing, A. L., Lucero, A. A., Gilson, M. S., & Almeida, D. M. (2006). The ebb and flow of marital lust: A relational approach. *Journal of Sex Research*, 43(2), 144-153.

Rosen, R. C., Heiman, J. R., Long, J. S., Fisher, W. A., & Sand, M. S. (2016). Men with sexual problems and their partners: Findings from the International Survey of Relationships. *Archives of Sexual Behavior*, 45(1), 159-173.

Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The International Index of Erectile Function (IIEF): a multidimensional scale for assessment of erectile dysfunction. *Urology*, 49(6), 822-830.

Rubio-Aurioles, E. (2015). Why we should stop confusing hypoactive sexual desire disorder with low sexual desire/interest syndrome. *The Journal of Sexual Medicine*, 12(10), 1989-1991.

Rubio-Aurioles, E., & Bivalacqua, T. J. (2013). Standard operational procedures for low sexual desire in men. *The Journal of Sexual Medicine*, 10(1), 94-107.

Sanchez-Cruz, J. J., Cabrera-Leon, A., Martın-Morales, A., Fernandez, A., Burgos, R., & Rejas, J. (2003). Male erectile dysfunction and health-related quality of life. *European urology*, 44(2), 245-253.

Sand, M., & Fisher, W. A. (2007). Women's endorsement of models of female sexual response: The nurses' sexuality study. *The Journal of Sexual Medicine*, 4(3), 708-719.

Sarin, S., Amsel, R. M., & Binik, Y. M. (2013). Disentangling desire and arousal: a classificatory conundrum. *Archives of sexual behavior*, 42(6), 1079-1100.

Sarin, S., Amsel, R., & Binik, Y. M. (2014). How hot is he? A psychophysiological and psychosocial examination of the arousal patterns of sexually functional and dysfunctional men. The *Journal of Sexual Medicine*, 11(7), 1725-1740.

Segraves, R., Balon, R., & Clayton, A. (2007). Reviews: proposal for changes in diagnostic criteria for sexual dysfunctions. *The Journal of Sexual Medicine*, 4(3), 567-580.

Shamloul, R., & Ghanem, H. (2013). Erectile dysfunction. *The Lancet*, 381(9861), 153-165.

Simonelli, C., Bonanno, D., Michetti, P. M., & Rossi, R. (2008). Premature ejaculation and dysregulation of emotions: Research and clinical implications. *Sexologies*, 17(1), 18-23.

Simonelli, C., Fabrizi, A., Rossi, R., Silvaggi, C., Tripodi, F., & Michetti, P. M. (2010). Clinical sexology: An integrated approach between the psychosomatic and the somatopsychic. *Sexologies*, 19(1), 3-7.

Skegg, K., Nada-Raja, S., Dickson, N., & Paul, C. (2010). Perceived "out of control" sexual behavior in a cohort of young adults from the Dunedin Multidisciplinary Health and Development Study. *Archives of Sexual Behavior*, 39(4), 968-978.

Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, 15-28.

Spielberger, C. D. (2010). *State-Trait anxiety inventory.* John Wiley & Sons, Inc.

Spiering, M., Everaerd, W., Karsdorp, P., Both, S., & Brauer, M. (2006). Nonconscious processing of sexual information: A generalization to women. *Journal of Sex Research*, 43(3), 268-281.

Stoléru, S. (2006). Discussion. In Janssen E. (Ed.) *The Psychophysiology of Sex* (p.376). Bloomington: Indiana University Press.

Štulhofer, A., Carvalheira, A. A., & Træen, B. (2013). Is responsive sexual desire for partnered sex problematic among men? Insights from a two-country study. *Sexual and Relationship Therapy*, 28(3), 246-258.

Štulhofer, A., Ferreira, L. C., & Landripet, I. (2014). Emotional intimacy, sexual desire, and sexual satisfaction among partnered heterosexual men. *Sexual and Relationship Therapy*, 29(2), 229-244.

Sun, C., Bridges, A., Johnson, J. A., & Ezzell, M. B. (2016). Pornography and the male sexual script: An analysis of consumption and sexual relations. *Archives of Sexual Behavior*, 45(4), 983-994.

Sungur, M. Z., & Gündüz, A. (2014). A comparison of DSM-IV-TR and DSM-5 definitions for sexual dysfunctions: critiques and challenges. *The Journal of Sexual Medicine*, 11(2), 364-373.

Sutherland, S. E., Rehman, U. S., Fallis, E. E., & Goodnight, J. A. (2015). Understanding the phenomenon of sexual desire discrepancy in couples. *The Canadian Journal of Human Sexuality*, 24(2), 141-150.

Tavares, I. M., Laan, E. T., & Nobre, P. J. (2017). Cognitive-Affective Dimensions of Female Orgasm: The Role of Automatic Thoughts and Affect During Sexual Activity. *The Journal of Sexual Medicine*, 14(6), 818-828.

Terraciano, A., McCrae, R. R., & Costa Jr, P. T. (2003). Factorial and construct validity of the Italian Positive and Negative Affect Schedule (PANAS). *European Journal of Psychological Assessment*, 19(2), 131-41.

Toates, F. (2014). *How Sexual Desire works. The Enigmatic Urge*. Cambridge: University Press.

Træen, B., & Stigum, H. (2010). Sexual problems in 18-67-year-old Norwegians. *Scandinavian Journal of Social Medicine*, 38(5), 445-456.

Træen, B., Martinussen, M., Öberg, K., & Kavli, H. (2007). Reduced sexual desire in a random sample of Norwegian couples. *Sexual and Relationship Therapy*, 22(3), 303-322.

Tripodi, F., Palumbo, F., Vavallo, A., Petruccelli, I., & Simonelli, C. (2015). Problematic Hypersexuality. *The ESSM Manual of Sexual Medicine*. Amsterdam: Medix.

Trudel, G., Marchand, A., Ravart, M., Aubin, S., Turgeon, L., & Fortier, P. (2001). The effect of a cognitive-behavioural group treatment program on hypoactive sexual desire in women. *Sexual and Relationship Therapy*, 16, 145-164.

Wagner, G. J., Remien, R. H., & Dieguez, A. C. (2000). Prevalence of extradyadic sex in male couples of mixed HIV status and its relationship to psychological distress and relationship quality. *Journal of Homosexuality*, 39(2), 31-46.

Ware, J.E., Jr., & Sherbourne, C.D. (1992). The MOS 36-item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection. *Medical Care*, 30, 473-483.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, 54(6), 1063-70.

Wéry, A., & Billieux, J. (2016). Online sexual activities: An exploratory study of problematic and non-problematic usage patterns in a sample of men. *Computers in Human Behavior*, 56, 257-266.

West, S. L., D'Aloisio, A. A., Agans, R. P., Kalsbeek, W. D., Borisov, N. N., & Thorp, J. M. (2008). Prevalence of low sexual desire and hypoactive sexual desire disorder in a nationally representative sample of US women. *Archives of Internal Medicine*, 168(13), 1441-1449.

Willoughby, B. J., & Vitas, J. (2012). Sexual desire discrepancy: The effect of individual differences in desired and actual sexual frequency on dating couples. *Archives of Sexual Behavior*, 41(2), 477-486.

Willoughby, B. J., Farero, A. M., & Busby, D. M. (2014). Exploring the effects of sexual desire discrepancy among married couples. *Archives of Sexual Behavior*, 43(3), 551-562.

Winters, J., Christoff, K., & Gorzalka, B. B. (2010). Dysregulated sexuality and high sexual desire: Distinct constructs? *Archives of Sexual Behavior*, 39(5), 1029-1043.

Wood, J. M., Koch, P. B., & Mansfield, P. K. (2006). Women's sexual desire: A feminist critique. *Journal of Sex Research*, 43(3), 236-244.

Wu, Y., Ku, L., & Zaroff, C. M. (2016). Sexual Arousal and Sexual Fantasy: The Influence of Gender, and the Measurement of Antecedents and Emotional Consequences in Macau and the United States. *International Journal of Sexual Health*, 28(1), 55-69.

Yıldız, H., & Bölüktaş, R. P. (2015). Evaluation of sexual dysfunction in males with diabetes. *Sexuality and Disability*, 33(2), 187-205.

Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197-206.

Zilbergeld, B., & Ellison, C. R. (1980). Desire discrepancies and arousal problems in sex therapy. *Principles and practice of sex therapy*, 1, 65-101.

Appendix: Tables and figures

Figure 1 *Classification of areas explored by the selected questionnaires*

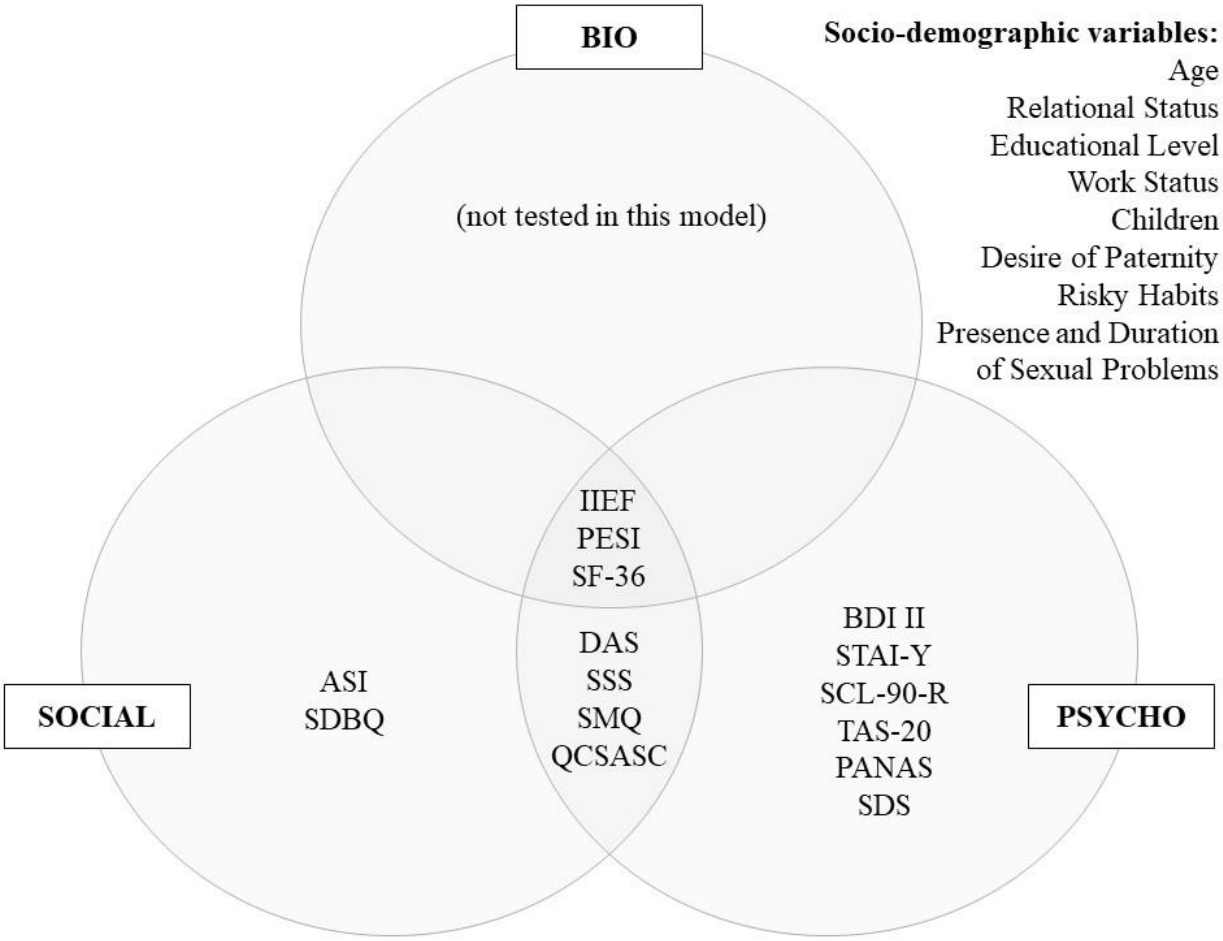


Table 1 *Socio-demographic characteristics of the group (n=298 heterosexual men)*

Variable	**n (%)**
Marital Status	219 unmarried (73.5%)
	61 married (20.5%)
	13 divorced (4.4%)
	5 not answered (1.7%)
Relational Status	101 single (33.9%)
	104 no cohabitant couple (34.9%)
	88 cohabitant couple (29.5%)
	5 not answered (1.7%)
Children	231 no (77.5%)
	58 yes (19.5%)
	9 not answered (3.0%)
Desire of Having a Baby	226 no (75.8%)
	63 yes (21.1%)
	9 not answered (3.0%)
Educational Level	15 middle school (5.0%)
	115 high school (38.6%)
	159 degree or higher (53.4%)
	9 not answered (3.0%)
Work Status	159 employed (53.4%)
	17 unemployed (5.6%)
	103 students (34.6%)
	10 retired (3.4%)
	9 not answered (3.0%)
Sexual Problems (last six months)	189 no sexual problems declared (63.4%)
	100 at least one sexual problem declared (33.6%)
	9 not answered (3.0%)

Table 2 *Mean and Standard Deviation (SD) of the questionnaire total scores for each test (n=298)*

Variable (Total score)	**Mean and SD (Min-Max)**
ASI	27.12±6.68 (7 -41.5)
BDI II	9.39±7.80 (0-44)
DAS	103.15±16.55 (48-133)
IIEF	52.41±18.99 (7-75)
PESI	27.44±19.56 (1-86)
QCSASC	42.95±17.65 (26-104)
SCL-90-R GSI	0.59±0.49 (0-2.62)
SDBQ	71.68±16.24 (38-124)
SDS-M	12.66±11.95 (0-48)
SF36	68.75±18.35 (10-100)
SMQ Total Emotion	14.09±6.89 (0-29)
SMQ Total Sexual Response	3.14±1.06 (0-5)
SMQ Total Thoughts	49.59±13.92 (28-101)
SSS-M	13.25±5.20 (6-25)
STAI-Y State	40.86±11.64 (20-75)
STAI-Y Trait	42.05±11.24 (20-74)
TAS-20	44.10±11.92 (21-79)

Table 3 *Predictors of Male's Sexual Desire – Hierarchical Multiple Regressions (enter method)*

Step 1* Socio-demographic Predictors *(Covariates)				***Step 2.1* Quality of Life Predictors**				***Step 2.2* Psychopathological Predictors**				***Step 2.3* Emotional Response Predictors**				***Step 2.4* Alexithymia Predictors**			
	B	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***
Age	-.018	.011	-.121		-.014	.011	-.095		-.017	.012	-.117		-.012	.012	-.085		-.017	.011	-.116
Relational Status	.275	.156	.128		.143	.161	.067		.127	.170	.059		.310	.170	.140		.226	.157	.105
Desire of Having a Baby	-.696	.276	-.161*		-.715	.283	-.164		-.708	.298	-.160		-.766	.309	-.169		-.670	.278	-.155
Educational Level	.302	.183	.103		.180	.187	.061		.306	.204	.105		.341	.198	.113		.236	.185	.081
Sexual Problems	-.303	.245	-.082		-.184	.256	-.050		-.245	.273	-.066		-.017	.294	-.004		-.283	.251	-.077
Duration of Sexual Problems	-.215	.209	-.067		-.131	.214	-.041		-.342	.227	-.106		-.229	.222	-.071		-.233	.209	-.073
*Bonferroni correct alpha $p<.008$				Physical Functioning	.006	.011	.045	Depression (BDI II)	.039	.025	.173	Worry	-.207	.973	-.019	Difficulty Identifying Feelings	-.024	.025	-.073
				Role Functioning Physical	-.011	.005	-.176	State-Anxiety (STAI-Y1)	-.009	.017	-.059	Sadness	2.416	1.559	.111	Difficulty Describing Feelings	-.010	.027	-.027
				Emotional Well-Being	-.004	.006	-.048	Trait-Anxiety (STAI-Y2)	-.014	.019	-.093	Disillusion	-1.960	1.289	-.123	Externally-Oriented Thinking	-.035	.026	-.096
				Role Functioning Emotional	-.003	.004	-.071	SOM - Somatization (SCL-90-R)	-.171	.327	-.052	Fear	-4.724	1.345	-.279*	*Bonferroni correct alpha $p<.006$			
				Energy/Fatigue	.036	.012	.320*	O-C - Obsessive-Compulsive (SCL-90-R)	-.185	.352	-.069	Guilt	.160	2.414	.004				
				Social Functioning	.009	.009	.090	I-S - Interpersonal Sensitivity (SCL-90-R)	-.003	.367	-.001	Shame	-3.056	1.893	-.122				
				Pain	-.014	.008	-.157	DEP - Depression (SCL-90-R)	-1.046	.419	-.391*	Anger	1.816	1.601	.085				
				*Bonferroni correct alpha $p<.004$				ANX - Anxiety (SCL-90-R)	.421	.431	.130	Hurt	-.194	4.873	-.003				
								HOS - Hostility (SCL-90-R)	.352	.290	.124	Pleasure	.286	.943	.029				
								PHOB - Phobic Anxiety (SCL-90-R)	-.058	.410	-.014	Satisfaction	.569	1.065	.048				
								PAR - Paranoid Ideation (SCL-90-R)	.278	.259	.112	*Bonferroni correct alpha $p<.004$							
								PSY - Psychoticism (SCL-90-R)	.142	.472	.041								
								*Bonferroni correct alpha $p<.003$											

***Step 2.5* Sexual Functioning Predictors**				***Step 2.6* Premature Ejaculation Severity Predictor**				***Step 2.7* Sexual Satisfaction Predictors**				***Step 2.8* Sexual Distress Predictor**				***Step 2.9* Dyadic Adjustment Predictors**			
	B	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***
Age	-.004	.010	-.028		-.016	.011	-.107		-.036	.013	-.253		-.020	.011	-.134		-.021	.015	-.147
Relational Status	-.103	.159	-.048		.290	.158	.133		.017	.231	.007		.253	.156	.117		-	-	-

Desire of Having a Baby	-.758	.257	-.175*		-.642	.281	-.147		-.868	.316	-.207		-.692	.274	-.160		-1.171	.369	-.276*
Educational Level	.209	.174	.071		.347	.188	.115		.339	.202	.121		.304	.184	.102		.215	.219	.078
Sexual Problems	.088	.240	.024		-.023	.268	-.006		-.188	.340	-.051		.043	.287	.012		-.153	.324	-.042
Duration of Sexual Problems	-.122	.199	-.038		-.262	.213	-.081		-.540	.248	-.163		-.282	.210	-.088		-.467	.280	-.139
Erectile Function	.042	.022	.225	Premature Ejaculation Severity	-.020	.006	-.214*	Contentment	.026	.036	.082	Sexual Distress	-.025	.011	-.168*	Dyadic Consensus	-.031	.020	-.171
Orgasmic Function	.098	.039	.186	*Bonferroni correct alpha p<.007				Communication	.138	.065	.398	*Bonferroni correct alpha p<.007				Dyadic Satisfaction	-.037	.040	-.083
Intercourse Satisfaction	.033	.045	.093					Compatibility	.315	.111	.505*					Dyadic Cohesion	.063	.043	.162
General Satisfaction	-.032	.058	-.048					Relational Concern	-.234	.093	-.377					Affectional Expression	.079	.102	.088
*Bonferroni correct alpha p<.005								Personal Concern	-.117	.062	-.253					*Bonferroni correct alpha p<.005			
								*Bonferroni correct alpha p<.005											

Step 2.10 **Sexism Predictors**				***Step 2.11*** **Negative Automatic Thoughts Predictors**				***Step 2.12*** **Subjective Sexual Response Predictor**				***Step 2.13*** **Dysfunctional Sexual Beliefs Predictors**				***Step 2.14*** **Cognitive Schemas Activated during Sexual Activity Predictors**			
	B	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***
Age	-.032	.012	-.212		-.012	.012	-.085		-.016	.011	-.111		-.011	.011	-.077		-.022	.012	-.151
Relational Status	.363	.181	.164		.195	.169	.088		.291	.172	.131		.314	.162	.143		.332	.172	.150
Desire of Having a Baby	-.919	.339	-.187		-.679	.294	-.150		-.691	.304	-.152		-.661	.286	-.148		-.837	.298	-.186*
Educational Level	.349	.219	.120		.146	.194	.048		.328	.197	.108		.174	.194	.058		.281	.200	.094
Sexual Problems	-.381	.294	-.091		.061	.300	.016		-.128	.270	-.033		-.478	.247	-.127		-.198	.291	-.052
Duration of Sexual Problems	-.226	.218	-.074		-.320	.216	-.099		-.199	.218	-.061		-.172	.215	-.053		-.300	.223	-.092
Hostile Sexism	.010	.015	.045	Failure Anticipation Thoughts	.018	.037	.047	Subjective Sexual Response	.381	.113	.222*	Sexual Conservatism	-.143	.036	-.305*	Undesirability - Rejection	.064	.041	.207
Benevolent Sexism	.020	.016	.094	Erection Concern Thoughts	-.031	.028	-.099	*Bonferroni correct alpha p<.007				Female Sexual Power	.056	.029	.156	Incompetence	-.087	.041	-.310
*Bonferroni correct alpha p<.006				Age and Body Related Thoughts	-.046	.058	-.065					"Macho" Belief	-.012	.033	-.032	Self-Depreciation	-.191	.094	-.212
				Negative Thoughts Toward Sex	.003	.047	.005					Beliefs about Women's Satisfaction	.075	.041	.188	Difference - Loneliness	-.054	.087	-.072
				Lack of Erotic Thoughts	-.208	.041	-.339*					Restrictive Attitude Toward Sex	.096	.063	.120	Helpless	.103	.079	.179
				*Bonferroni correct alpha p<.005								Sex as an Abuse of Men's Power	-.284	.105	-.225	*Bonferroni correct alpha p<.005			
												*Bonferroni correct alpha p<.004							

Table 4 *Main Predictors of Male's Sexual Desire*

	Model 1 Socio-demographic (Covariates)			Model 2 Main Predictors of Male Sexual Desire		
Predictors	***B***	***SE***	***β***	***B***	***SE***	***β***
Age	-.018	.011	-.121	-.016	.013	-.113
Relational Status	.275	.156	.128	-.030	.235	-.012
Desire of Having a Baby	-.696	.276	-.161*	-1.133	.326	-.259**
Educational Level	.302	.183	.103	.292	.234	.093
Sexual Problems	-.303	.245	-.082	.213	.354	.055
Duration of Sexual Problems	-.215	.209	-.067	-.437	.256	-.132
Energy/Fatigue (SF36)				-.002	.011	-.016
Depression (SCL-90-R)				-.070	.294	-.024
Fear (SMQ)				-3.941	1.310	-.259**
Premature Ejaculation Severity (PESI)				.002	.009	.021
Compatibility (SSS)				.069	.048	.108
Sexual Distress (SDS)				-.010	.017	-.063
Lack of Erotic Thoughts (SMQ)				-.217	.059	-.328**
Subjective Sexual Response (SMQ)				.086	.144	.051
Sexual Conservatism (SBDQ)				-.031	.038	-.070
* Bonferroni correct alpha level $p<.008$; ** Bonferroni correct alpha level $p<.003$						
R^2		.061			.281	
ΔR^2		.061			.220	
F for change in R^2		3.216**			9.312***	

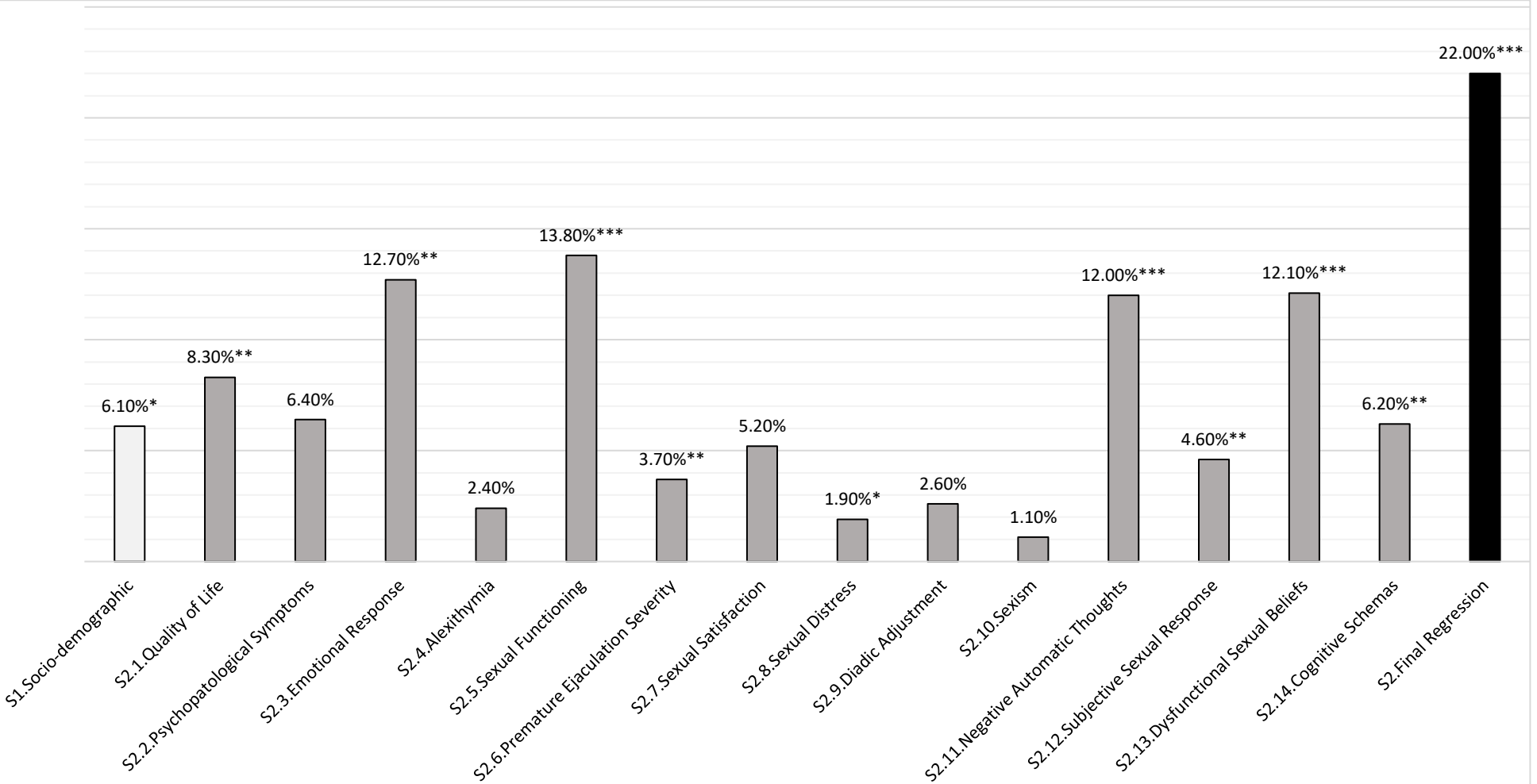
**$p<.05$; ***$p<.001$

Table 5 *Pearson Correlations between level of sexual desire and socio-demographic variables*

Variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	Sexual Desire Level (IIEF)	–															
2.	Age	-.093	–														
3.	Relational Status	.022	.460***	–													
4.	Desire of Having a Baby	-.157*	.120*	.199**	–												
5.	Educational Level	.088	.089	-.131*	.037	–											
6.	Sexual Problems	-.122	.286***	.180**	.215***	-.010	–										
7.	Duration of Sexual Problems	.001	.331**	.205	.189	-.049	.147	–									
8.	Energy/Fatigue (SF36)	.169**	-.011	.046	.051	.088	-.177**	.005	–								
9.	Depression (SCL-90-R)	-.168**	-.070	-.200**	-.042	.027	.279***	-.132	-.605***	–							
10.	Fear (SMQ)	-.265***	.208**	.088	-.068	.054	.170*	-.136	-.144*	.108	–						
11.	Premature Ejaculation Severity (PESI)	-.222***	.186**	.156*	.173**	-.027	.424***	.187	-.180**	.257***	.242***	–					
12.	Compatibility (SSS)	-.020	-.160*	-.013	.121	.109	-.095	.085	.154*	-.123	.060	-.206**	–				
13.	Sexual Distress (SDS)	-.179**	.090	.040	.104	.010	.544***	.124	-.293***	.422***	.044	.600***	-.215**	–			
14.	Lack of Erotic Thoughts (SMQ)	-.339***	.043	-.120	.003	-.131*	.166*	-.174	-.227**	.238***	.087	.368***	-.245**	.387***	–		
15.	Subjective Sexual Response (SMQ)	.263***	-.089	.065	-.058	.005	-.205**	.053	.189**	-.234***	-.202**	-.284***	.139	-.355***	-.504***	–	
16.	Sexual Conservatism (SBDQ)	-.230***	.059	.072	-.013	-.244***	-.026	.153	-.053	.002	.247***	.196**	-.115	.037	.296***	-.086	–

*p<.05; **p<.01; ***p<.001

Figure 2. *Percentage of variance explained (ΔR-squared) for each regression model having Socio-demographic variables as covariates.*



Note: S1 indicates the variance explained by the covariates set; S2 indicates the variance explained (ΔR-squared) by the second steps of the Hierarchical Multiple Regressions showed in Table 3 and 4. Significance of F Change (ΔR-squared) = *p<.05; **p<.01; ***p<.001

Table 6 *Socio-demographic characteristics of the group (n=450 heterosexual men)*

Variable	**n (%)**
Marital Status	367 unmarried (81.6%)
	70 married (15.5%)
	13 divorced (2.9%)
Relational Status	170 single (37.8%)
	162 no cohabitant couple (36.0%)
	118 cohabitant couple (26.2%)
Children	389 no (86.4%)
	61 yes (13.6%)
Desire of Having a Baby	364 no (80.9%)
	86 yes (19.1%)
Educational Level	18 middle school (4.0%)
	169 high school (37.6%)
	263 degree or higher (58.4%)
Work Status	231 employed (51.3%)
	34 unemployed (7.6%)
	178 students (39.6%)
	7 retired (1.6%)
Smoke	288 used in the past/never used (64.0%)
	52 from 1 to 5 (11.6%)
	73 from 6 to 15 (16.2%)
	37 more than 15 (8.2%)
Alcohol Use	41 used in the past/never used (9.1%)
	178 a few times a month (39.6%)
	180 1-2 times a week (40.0%)
	51 every day or almost every day (11.3%)
Drugs Use	227 never used (50.4%)
	122 used in the past (not now) (27.1%)
	80 occasional (17.8%)
	21 habitual (4.7%)
Sexual Problems (in the last 6 months)	318 no sexual problems declared (70.6%)
	132 at least one sexual problem declared (29.4%)
	57 Primary (43.2%)
	72 Secondary (54.5%)
	3 do not know (2.3%)
	33 Generalized (25.0%)
	85 Situational (64.4%)
	14 do not know (10.6%)

Table 7 *Mean and Standard Deviation (SD) of questionnaires' total scores*

Variable (Total score)	**Mean and SD (Min-Max)**
ASI	26.26±6.87 (4.5-41.5)
DAS	110.33±17.88 (40-145)
IIEF	52.65±19.75 (5-75)
PANAS	27.41±6.87 (22-89)
PESI	29.17±19.47 (1-86)
QCSASC	43.97±18.64 (25-110)
SCL-90-R GSI	0.61±0.51 (0-.99)
SDBQ	56.92±14.00 (29-106)
SDS	11.60±11.66 (0-48)
SF36	70.35±17.60 (0-100)
SMQ Total Automatic Thoughts	45.90±13.13 (24-96)
SSS	92.89±17.91 (49.5-120)
TAS-20	43.69±11.08 (20-79)

Table 8 *Pearson Correlations between Level of Sexual Desire and Socio-demographic variables*

Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1.Sexual Desire Level (IIEF)	–										
2.Age	-.137**	–									
3.Relational Status	.009	.413***	–								
4.Having Children	-.014	.668***	.443***	–							
5.Desire of Having Children	-.078	.216***	.199***	.039	–						
6.Educational Level	-.001	-.042	-.013	-.150**	.041	–					
7.Smoke	.012	-.123**	-.051	-.063	-.050	-.127**	–				
8.Alcohol Use	.016	.126**	.034	.059	-.035	.076	.142**	–			
9.Drugs Use	.077	-.245***	-.140**	-.200**	-.043	.078	.337**	.189***	–		
10.Sexual Problems	-.170***	.273***	.130**	.158**	.158**	.025	-.011	.105*	-.049	–	
11.Duration of Sexual Problems	.013	.292**	.162	.263**	.234*	-.001	-.072	.005	-.165	-.082	–

*p<.05; **p<.01; ***p<.001

Table 9 *Predictors of Male's Sexual Desire – Hierarchical Multiple Regressions (enter method)*

Step 1 **Socio-demographic Predictors *(Covariates)***				***Step 2.1*** **Quality of Life Predictors**				***Step 2.2*** **Psychopathological Predictors**				***Step 2.3*** **Emotional Response Predictors**				***Step 2.4*** **Alexithymia Predictors**			
	B	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***
Age	-.019	.009	-.113		-.014	.010	-.085		-.017	.009	-.100		-.029	.013	-.176		-.019	.009	-.117
Relational Status	.211	.116	.093		.153	.121	.068		.171	.120	.076		.109	.162	.048		.184	.116	.082
Desire of Having a Baby	-.212	.219	-.047		-.315	.226	-.069		-.259	.224	-.057		.341	.350	.067		-.231	.218	-.051
Educational Level	-.001	.146	.000		-.030	.150	-.009		.076	.151	.024		-.109	.199	-.036		-.035	.146	-.011
Drugs Use	.105	.095	.053		.145	.098	.073		.106	.097	-.053		.044	.125	.024		.108	.097	.055
Sexual Problems	-.555	.190	-.141*		-.531	.202	-.135*		-.527	.204	-.133		-.265	.309	-.058		-.500	.195	-.128
*Bonferroni correct alpha $p<.008$				Physical Functioning	.000	.007	.001	SOM - Somatization	-.036	.230	-.010	Positive Affects	.094	.018	.387*	Difficulty Identifying Feelings	-.016	.019	-.050
				Role Functioning Physical	-.005	.004	-.075	O-C - Obsessive-Compulsive	.125	.237	-.049	Negative Affects	-.002	.019	-.007	Difficulty Describing Feelings	-.021	.022	-.052
				Emotional Well-Being	.007	.008	.073	I-S - Interpersonal Sensitivity	-.021	.277	-.007	*Bonferroni correct alpha $p<.006$				Externally-Oriented Thinking	-.013	.020	-.031
				Role Functioning Emotional	.001	.003	.030	DEP - Depression	-.770	.290	-.298*					*Bonferroni correct alpha $p<.006$			
				Energy/Fatigue	.005	.007	.050	ANX - Anxiety	.100	.285	.032								
				Social Functioning	-.003	.005	-.045	HOS - Hostility	.171	.188	.065								
				Pain	-.005	.006	-.048	PHOB - Phobic Anxiety	.122	.298	.028								
				General Health	.007	.006	.069	PAR - Paranoid Ideation	.230	.194	.090								
				Health Change	-.002	.003	-.027	PSY - Psychoticism	.213	.334	.062								
				*Bonferroni correct alpha $p<.003$				*Bonferroni correct alpha $p<.003$											

Step 2.5 **Sexual Functioning Predictors**				***Step 2.6*** **Premature Ejaculation Severity Predictor**				***Step 2.7*** **Sexual Satisfaction Predictors**				***Step 2.8*** **Sexual Distress Predictor**				***Step 2.9*** **Dyadic Adjustment Predictors**			
	B	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***
Age	-.011	.008	-.063		-.011	.011	-.064		-.031	.010	-.197*		-.020	.009	-.122		-.013	.011	-.082
Relational Status	-.190	.117	-.084		.232	.140	.102		.021	.158	.008		.170	.116	.075		-	-	-
Desire of Having a Baby	-.217	.202	-.048		-.391	.253	-.088		-.382	.244	-.089		-.210	.217	-.046		-.485	.283	-.111
Educational Level	-.005	.135	-.002		.099	.171	.032		.093	.160	.031		.010	.144	.003		.063	.176	.021
Drugs Use	.004	.089	.002		.141	.115	.070		-.099	.115	-.049		.078	.095	.040		-.072	.124	-.036
Sexual Problems	-.142	.184	-.036		-.067	.238	-.018		-.314	.275	-.080		-.201	.225	-.051		-.631	.248	-.165
Erectile Function	.027	.017	.150	Premature Ejaculation Severity	-.018	.006	-.198*	Contentment	.040	.028	.125	Sexual Distress	-.025	.008	-.161*	Dyadic Consensus	-.027	.016	-.143
Orgasmic Function	.088	.029	.167*	*Bonferroni correct alpha $p<.007$				Communication	-.010	.024	-.029	*Bonferroni correct alpha $p<.007$				Dyadic Satisfaction	.006	.021	.020
Intercourse Satisfaction	.053	.035	.153					Compatibility	.014	.023	.044					Dyadic Cohesion	.038	.033	.088

General Satisfaction	.014	.045	.021

*Bonferroni correct alpha $p<.006$

Relational Concern	.023	.027	.078
Personal Concern	.013	.030	.047

*Bonferroni correct alpha $p<.005$

Affectional Expression	.043	.076	.047

*Bonferroni correct alpha $p<.005$

Step 2.10 **Sexism Predictors**				***Step 2.11*** **Negative Automatic Thoughts Predictors**				***Step 2.12*** **Dysfunctional Sexual Beliefs Predictors**				***Step 2.13*** **Cognitive Schemas Activated during Sexual Activity Predictors**			
	B	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***		***B***	***SE***	***β***
Age	-.021	.010	-.123		-.014	.009	-.084		-.018	.009	-.106		-.019	.009	-.112*
Relational Status	.236	.124	.103		.084	.118	.037		.234	.118	.103		.192	.120	.085
Desire of Having a Baby	-.234	.244	-.048		-.234	.222	-.050		-.177	.225	-.038		-.309	.225	-.067
Educational Level	.034	.157	.011		-.015	.143	-.005		-.026	.150	-.008		-.022	.152	-.007
Drugs Use	.098	.099	.050		.090	.095	.044		.032	.097	.016		.070	.097	.035
Sexual Problems	-.566	.214	-.133		-.009	.225	-.002		-.761	.197	-.192*		-.351	.214	-.088
Hostile Sexism	.030	.011	.146*	Erection Concern Thoughts (ECT)	-.076	.023	-.223*	Macho Belief (MB)	.013	.009	.077	Helpless	-.028	.014	-.161*
Benevolent Sexism	.003	.011	.013	Lack of Erotic Thoughts (LET)	-.147	.027	-.267*	Sexual Conservatism (SC)	-.065	.021	-.154*	Unlovable	-.001	.014	-.004
*Bonferroni correct alpha $p<.006$				Age and Body Related Thoughts (ABT)	.028	.033	.045	Control over Sexuality (CS)	.054	.034	.084	*Bonferroni correct alpha $p<.006$			
				Negative Thoughts toward Sex (NTS)	-.102	.065	-.080	*Bonferroni correct alpha $p<.006$							
				Failure Anticipation Thoughts (FAT)	.030	.022	.089								
				*Bonferroni correct alpha $p<.005$											

Table 10 *Main Predictors of Male's Sexual Desire*

	Model 1 Socio-demographic (Covariates)			Model 2 Main Predictors of Male Sexual Desire		
Predictors	***B***	***SE***	***β***	***B***	***SE***	***B***
Age	-.019	.009	-.113	-.006	.012	-.034
Relational Status	.211	.116	.093	.098	.155	.042
Desire of Having a Baby	-.212	.219	-.047	-.537	.282	-.110
Educational Level	-.001	.146	.000	-.016	.179	-.005
Drugs Use	.105	.095	.053	.157	.118	.079
Sexual Problems	-.555	.190	-.141*	-.164	.272	-.040
Depression (SCL-90-R)				-.187	.174	-.073
Positive Affect (PANAS)				.056	.017	.143**
Orgasmic Function (IIEF)				.139	.033	.258**
Premature Ejaculation Severity (PESI)				-.015	.007	-.154
Sexual Distress (MSDS)				.036	.015	.223
Hostile Sexism (ASI)				.035	.012	.166**
Erection Concerns Thoughts (ECT) (SMQ)				-.087	.032	-.191**
Lack of Erotic Thoughts (LET) (SMQ)				-.150	.041	-.248**
Sexual Conservatism (SC) (SBDQ)				-.030	.026	-.069
Helpless (QCSASC)				-.013	.018	-.059
* Bonferroni correct alpha level $p<.008$; ** Bonferroni correct alpha level $p<.003$						
R^2		.048			.335	
ΔR^2		.048			.287	
F for change in R^2		3.533^{***}			9.564^{***}	

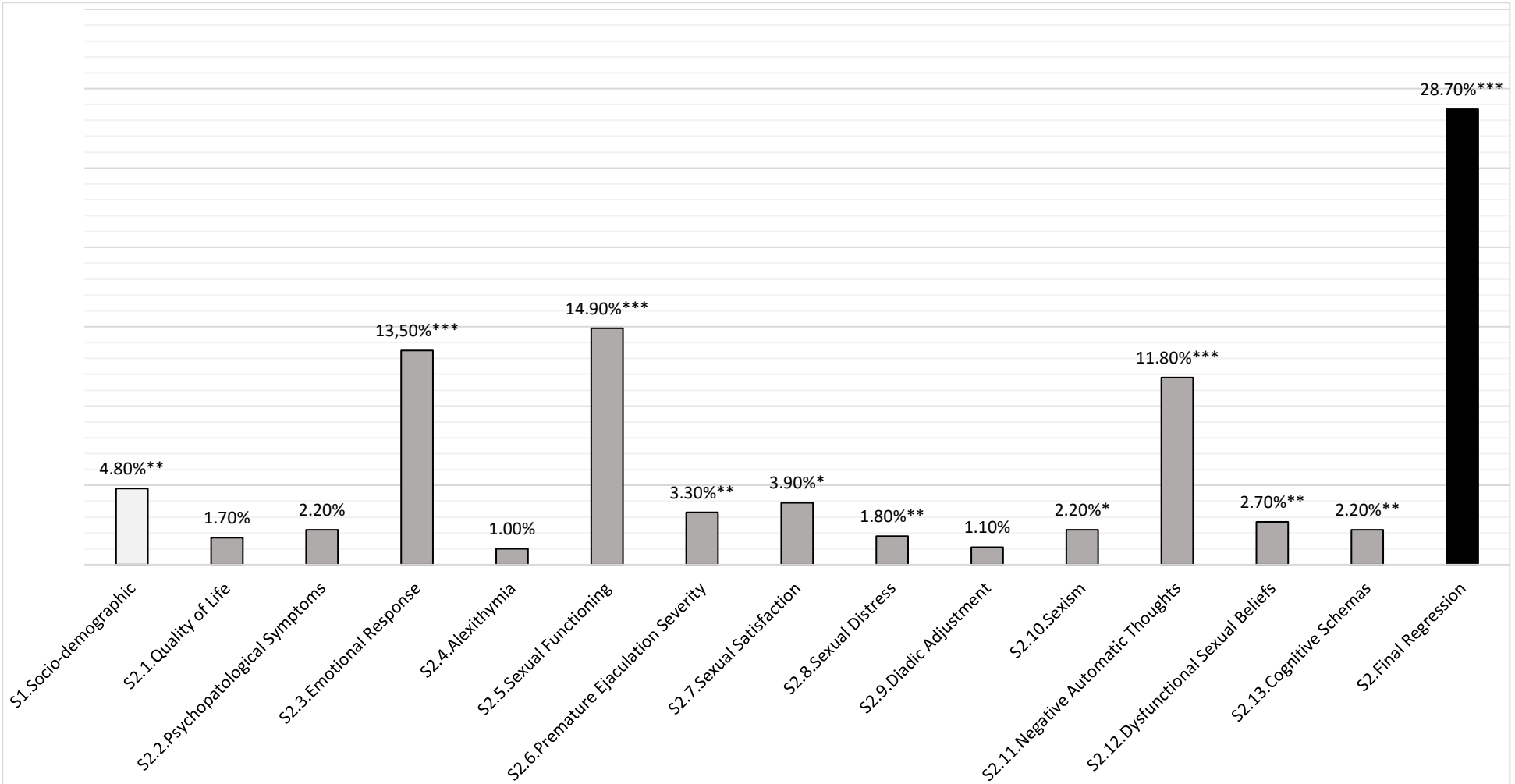
***$p<.001$

Table 11 *Pearson Correlations between level of sexual desire and Socio-demographic variables*

Variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Sexual Desire Level (IIEF)	–																
2	Age	-.137**	–															
3	Relational Status	.009	.413***	–														
4	Desire of Having a Baby	-.078	.216***	.199***	–													
5	Educational Level	-.001	-.042	-.013	.041	–												
6	Drugs Use	.077	-.245***	-.140**	-.043	.078	–											
7	Sexual Problems	-.170***	.273***	.130**	.158**	.025	-.049	–										
8	Depression (SCL-90-R)	-.100*	-.098*	-198***	-.024	.008	.124**	.225***	–									
9	Positive Affect (PANAS)	.316***	-.171*	-.015	.165*	-.075	.038	-.213**	-.112	–								
10	Orgasmic Function (IIEF)	.384***	-.089	.170***	-.008	.002	.029	-.186***	-.144**	.206**	–							
11	Premature Ejaculation Severity (PESI)	-.225***	.197***	.076	.084	-.037	-.089	.382***	.243***	-.535***	-.140*	–						
12	Sexual Distress (MSDS)	-.206***	.067	-.052	.060	.034	-.080	.534***	.466***	-.280***	-.206***	-.596***	–					
13	Hostile Sexism (ASI)	.151**	-.069	-.063	.006	-.149**	.024	.001	.076	.041	.059	-.034	.011	–				
14	Erection Concerns Thoughts (ECT) (SMQ)	-.267***	.147**	.039	.094	.008	-.090	.507***	.341***	-.333***	-.133**	.410***	.643***	.038	–			
15	Lack of Erotic Thoughts (LET) (SMQ)	-.326***	.084	-.135**	-.065	-.041	-.025	.215***	.152**	-.466***	-.262***	.355***	.340***	.034	.252***	–		
16	Sexual Conservatism (SC) (SBDQ)	-.099*	.029	-.012	.029	-.121*	-.081	-.063	-.016	-.091	.006	.141*	.017	.202***	.052	.262***	–	
17	Helpless (QCSASC)	-.213***	.097*	-.018	-.028	.023	-.041	.404***	.462***	-.291***	-.095*	.496***	.696***	.011	.588***	.277***	.118*	–

*p<.05; **p<.01; ***p<.001

Figure 3. *Percentage of variance explained (ΔR-squared) for each regression model having Socio-demographic variables as covariates.*



Note: S1 indicates the variance explained by the covariates set; S2 indicates the variance explained (ΔR-squared) by the second steps of the Hierarchical Multiple Regressions showed in Table 3 and 4. Significance of F Change (ΔR-squared) = *p<.05; **p<.01; ***p<.001

Figure 4. *Biopsychosocial model applied to the results of Study 2*

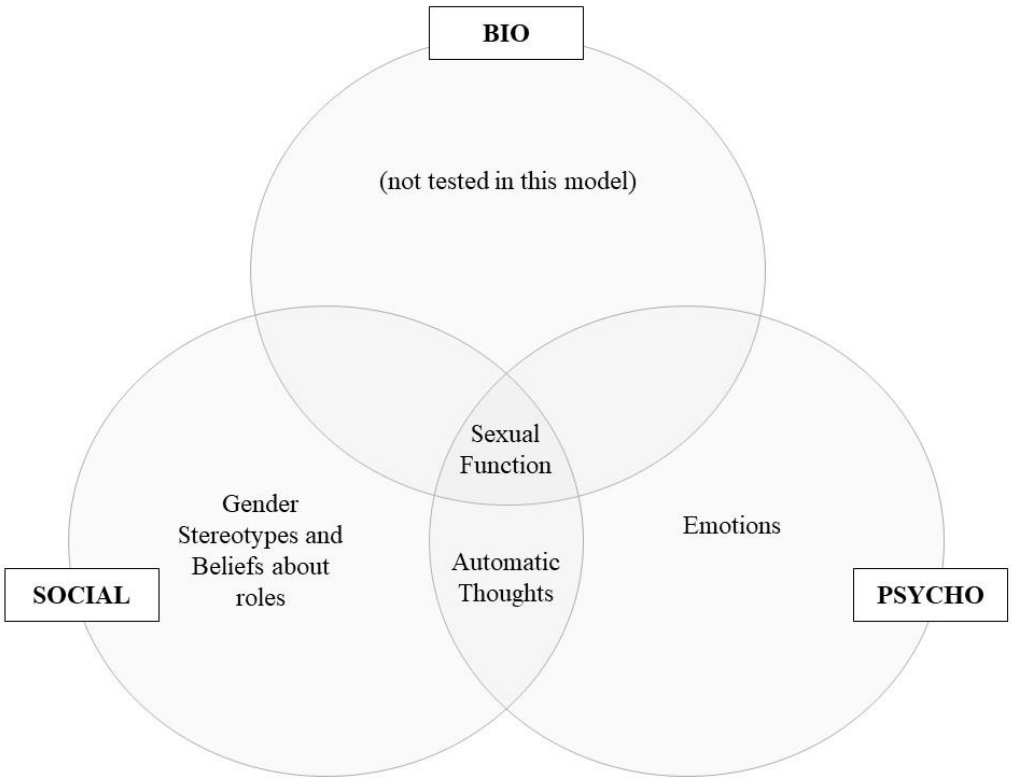
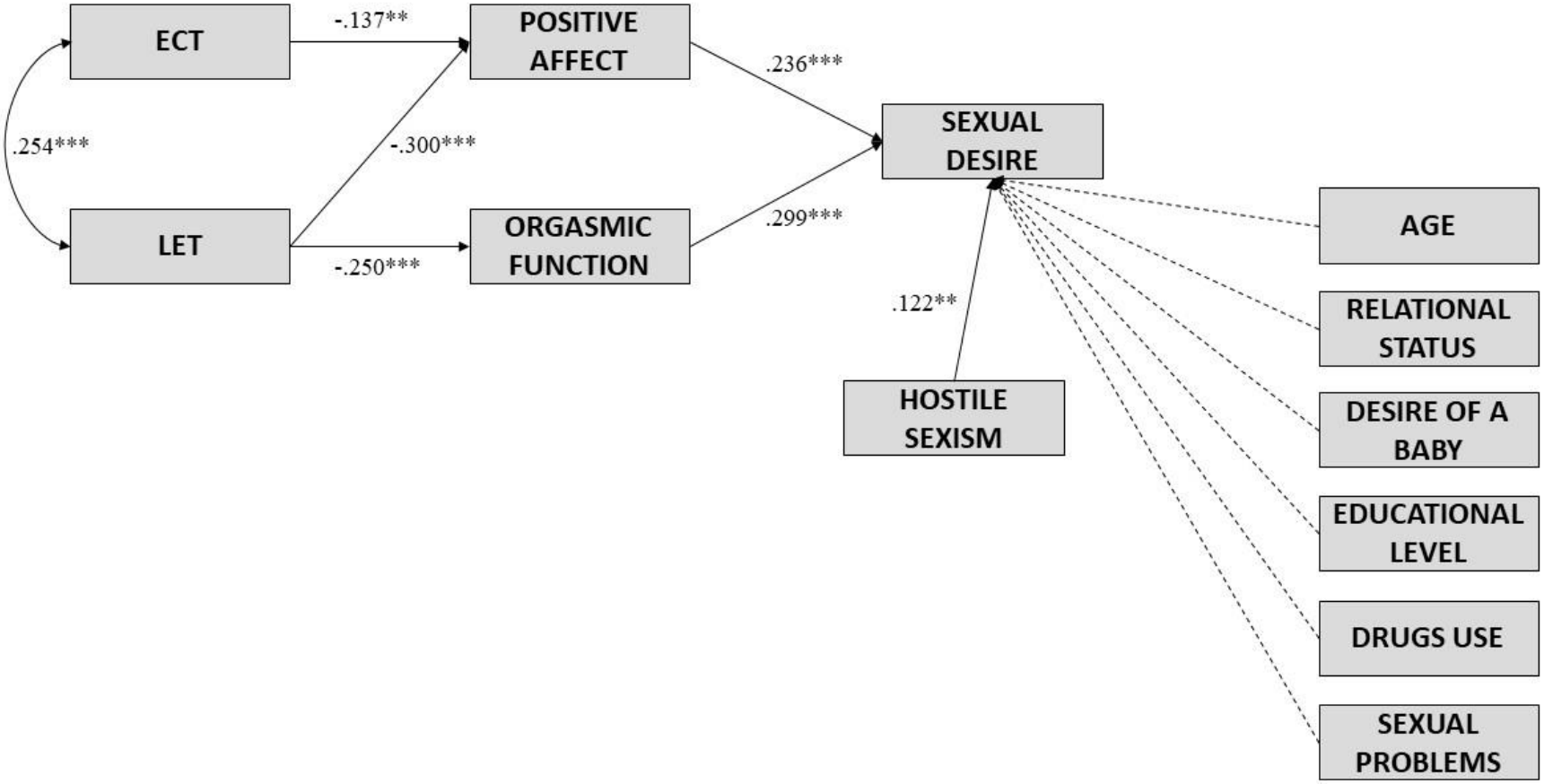
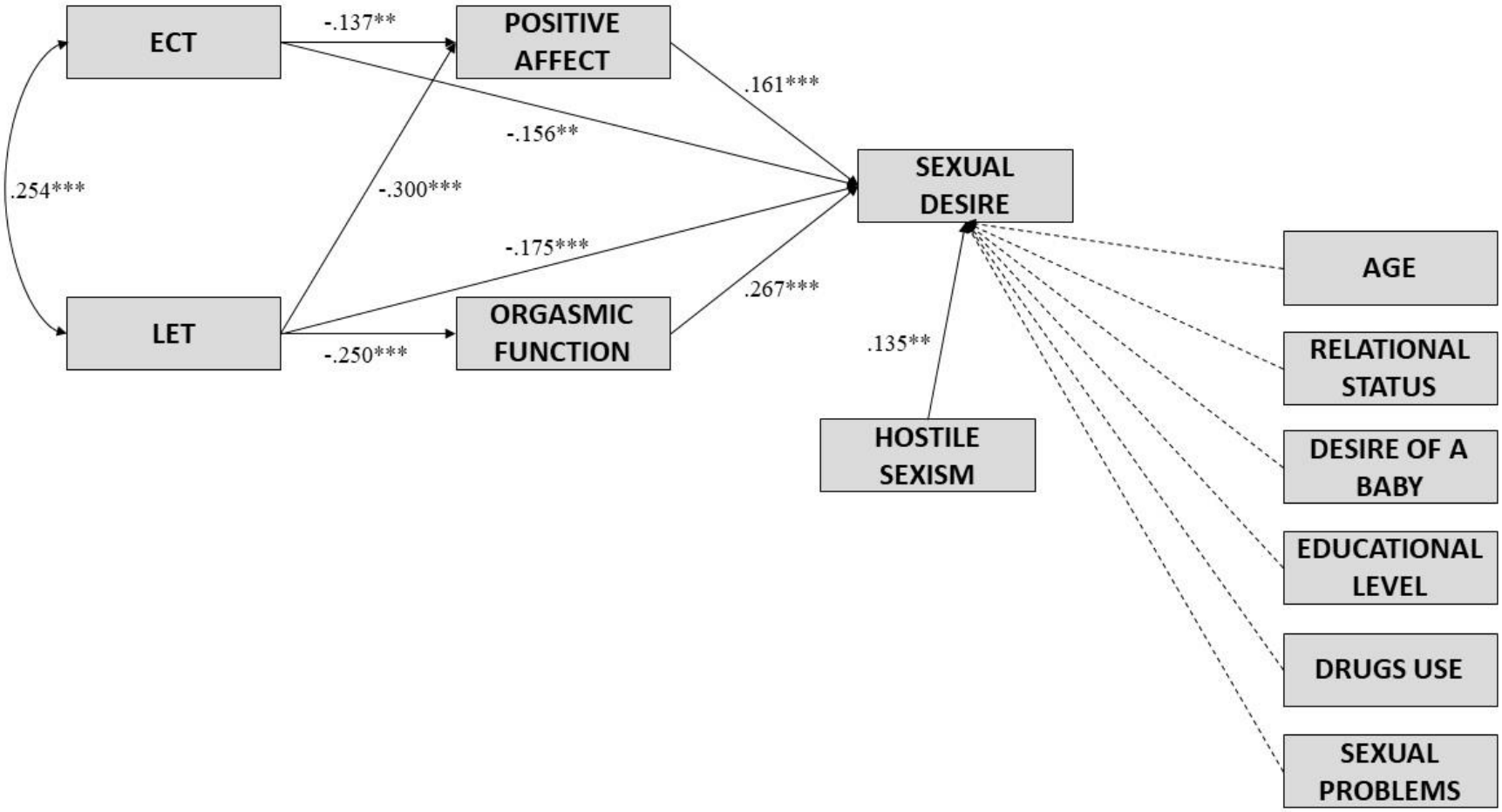


Figure 5. *Full mediation model of ECT and LET on Sexual Desire though Positive Affect and Orgasmic Function*



Note: *=p<.05; **=p<.01; ***=p<.001; Dashed line = Not significant path. Observed variables and residuals errors are omitted for simplicy.

Figure 6. *Partial mediation model of ECT and LET on Sexual Desire though Positive Affect and Orgasmic Function*



Note: *=p<.05; **=p<.01; ***=p<.001; Dashed line = Not significant path. Observed variables and residuals errors are omitted for simplicy.