Gender differences in sexual dysfunction in people with schizophrenia

Rapportens samlede antal tegn
(med mellemrum og fodnoter): 84.255
Svarende til antal normalsider: 35,1

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Abstract

Introduction and research question: *In the interest of improving treatment outcome, treatment compliance and quality of life for patients with schizophrenia, it is important to consider aspects regarding sexual functioning. The aim of this paper is to find the prevalence of sexual dysfunction in a sample of people with schizophrenia and to explore if there is a between-gender bias.*

Theory and methods: *Sexual functioning was assessed by using the short form of the Changes in Sexual Functioning Questionnaire (CFSQ-14). The CSFQ-14 is a reliable and well validated measure. To foster an understanding of sexual functioning, concepts from Kaplan's tri-phasic theory of the sexual response cycle are used as a theoretical framework. According to this theoretical framework, the sexual response cycle consists of three phases in both males and females: Desire, arousal and orgasm. As a result, sexual impairment can happen in any of the three phases, or all together and the CSFQ-14 is known to account for this by providing measures that target the three phases of the sexual response cycle. The study was made as a cross-sectional, group differences design, where the CSFQ-14 was translated into Danish and used in an online survey.*

Results: *In total 61 participants with schizophrenia completed the online survey with the CSFQ-14. Of the 61 participants, 42,6 % were found to suffer from sexual dysfunction, according to the criteria set by the CSFQ-14. 61,5 % of the male participants and 37,5 % of the female participants were found to experience sexual dysfunction. These numbers are in line with previous research findings. There was no significant effect of gender on either of the subscale test results nor the total test result score of the CSFQ-14. Additionally, no effect of gender on the prevalence of sexual dysfunction on either of the subdomains of the CSFQ-14 or regarding overall impairment was found.*

Conclusion: *The results show that the prevalence of sexual dysfunction among people with schizophrenia is high. Furthermore, these findings suggest that there is no gender bias in the prevalence of sexual dysfunction among people with schizophrenia. Consequently, it is advocated that mental health professionals should attend to issues of sexual dysfunction in people with schizophrenia. Although, further research is needed to validate these findings and the translated version of the CSFQ-14.*

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Introduction

A healthy sex life is an important aspect of our well-being and quality of life. It has even been stated that sexual well-being is nowadays considered to be one of the most important aspects of one's quality of life (Calabrò et al., 2019, p. 12). It also plays an important role regarding who we are and is a motivational factor that guides our behaviour in our daily lives. Sexual dysfunction is a problem and considerably so in people with schizophrenia (Acuña et al., 2010, p. 3414).

But what happens when this issue is not addressed? In a group of male outpatients with schizophrenia, Olfson et al. (2005) found that sexual dysfunction is linked with diminished quality of life, decreased formation of romantic relationships and reduced intimacy when relationships are formed (p. 337). In addition, Perkins (2002) found that sexual dysfunction is one of the major factors contributing to non-compliance with antipsychotic medication in people with schizophrenia (p. 1121). This is a critical problem, as the consequences of non-compliance with treatment according to Perkins (2002) are: *"Relapse, rehospitalisation, poor outcome and high economic costs"* (p. 1121). Even so, for those suffering from schizophrenia, sexual functioning has received little attention according to researchers within the field (de Boer et al., 2015, p. 674). This is despite the fact that psychiatric facilities nowadays claim to be providing patients with holistic biopsychosocial treatments. In order to prevent poor treatment outcome, relapses and rehospitalisation we need to aid mental health professionals in improving interventions by raising awareness of this issue. This can only be done by studying, acknowledging and supporting sexual intimacy needs and addressing sexual dysfunction. This will not only enhance our knowledge and understanding of the individual needs and concerns, but as Jager & McCann (2017) state it, it will also help support people with schizophrenia in a more empowering and recovery-oriented way (p. 239).

Another concern is whether mental health professionals actually have the resources and training to address the issues of intimacy and sexual functioning. Bengtsson-Tops & Hansson (1999) found that patients with schizophrenia rate "intimate relationships" and "sexual expression" as some of the most important treatment areas that need to be addressed but are not currently being considered (p. 513). Furthermore, it was found by Tharoor, Kaliappan & Gopal (2015) that the majority of psychiatric staff members (73,2 %) did not discuss sexual concerns with patients and expressed that they lack the necessary expertise to address the issue (p. 85). Besides the need for

more training, perhaps the topic of intimacy and sexual health is still a taboo in the psychiatric regime or perhaps mental health professionals are simply not aware that some patients ask for this matter to be addressed. Perhaps there is a misperception that patients will openly ask for help, when needed. However, Kelly and Conley (2004) state that in fact, most people do not spontaneously report sexual dysfunction to their mental health professionals because of how sensitive the topic is (p. 769). It has also been confirmed that the rate of sexual dysfunction was found to be lower when based on patients spontaneous reports than when based on mental health professionals directly asking patients (ibid.). Moreover, it is not even a given fact that patients are willing to discuss these matters. However, Wasow (1980) found that patients (not only patients with schizophrenia) are actually eager to discuss these issues when mental health professionals bring it up (p. 10).

In order to contribute to an evolving line of research that investigates sexual functioning in people with schizophrenia, the purpose of the present study is to find the prevalence of sexual dysfunctions in a sample of people with schizophrenia and to find out whether there is a significant between-gender difference. Furthermore, it is examined what type of sexual impairments that are most frequent. Studying sexual functioning in patients with schizophrenia can be methodologically complex since sexual functioning and sexual dysfunction can involve one or more components of the sexual response cycle (Fan et al., 2007, p. 120). Therefore, Kaplan's (1979) theoretical framework will be used to describe and grasp the concepts of the sexual response cycle. These concepts are operationalised by the use of a standardised measure of sexual functioning, that assesses the different aspects of the sexual response cycle.

The used measure is a Danish translation of the 14-item clinical version of the *Changes in Sexual Functioning Questionnaire* (CSFQ-14). The CSFQ-14 was created by Clayton (1998) and is found in Appendix 1, while the Danish translation made by the author of the present study, is found in Appendix 2. This measure will be used to assess sexual dysfunction and determine the prevalence of sexual dysfunction and how gender influences sexual functioning in people with schizophrenia (Clayton, 1998 and Keller, McGarvey & Clayton, 2006). The CSFQ-14 exists in several versions. Besides the 14-item version there is a longer 35/36-item version, which the 14-item version is based on. The CSFQ-14 exists in a version for males (CSFQ-14-M) and a version for females (CSFQ-14-F) and is thus gender-specific. The CSFQ-14 is a questionnaire concerning sexual activity, sexual functioning regarding sexual intercourse, masturbation, sexual

fantasies, sexual desire, sexual arousal and sexual completion. The study is cross-sectional and will be carried out by using the CSFQ-14 in an online survey. The rationale behind the present study is that findings in this research area have been somewhat conflicting. Clarifying how prevalent sexual dysfunction is among people with schizophrenia and whether gender exerts an influence, would aid mental health professionals in providing better interventions, enhance treatment compliance and hopefully increase the quality of life in this section of the population.

Structure of the paper

The paper will open with a literature review, that outlines existing knowledge about the prevalence of sexual dysfunctions among people with schizophrenia and on between-gender differences. Next the theoretical framework, which is comprised of early theories of schizophrenia and theories of the sexual response cycle, is outlined. This is followed by an account of the neural mechanisms of the sexual response cycle. Then the methods of this paper and the choice of statistical analysis are elaborated. The findings of the study are then discussed. Finally, there will be a section with a conclusion and further perspectives.

Problem formulation

What is the prevalence of sexual dysfunction among people (both in- and outpatients) with schizophrenia? Does gender influence the prevalence of sexual dysfunction in people with schizophrenia, and if so, how?

Literature review

According to a recent paper, there is a scarcity of literature that explores sexual functioning in people with schizophrenia (de Boer et al., 2015, p. 674). However, a general finding is that sexual functioning is both qualitatively and quantitatively different in people with schizophrenia compared to those without the disorder (Kelly & Conley, 2004, p. 767). That is, people with schizophrenia tend to display less interest in sexual activities and the prevalence of sexual dysfunctions in people with schizophrenia has been found to be greater than in the general population (Östman & Björkman, 2013, p. 20). In addition, Lyketsos et al. (1983) reported that patients with schizophrenia had sexual intercourse less frequently and were less satisfied with sex than an unmatched control group (pp. 376-377). In a review of the topic, Baggaley (2008) reports an estimate of sexual

dysfunction among patients with schizophrenia to be 30-80 % (Baggaley, 2008, p. 201). This estimate is based on several studies that employed different measures of sexual functioning and different definitions of sexual dysfunction. This multitude of definitions and variance in methodology may have contributed to the large estimate margin. For instance, in a prevalence study by Dossenbach et al. (2005), 50 % of the participants (patients with schizophrenia, n = 7655) reported that they experience 'some problems' or were 'unable to perform sexually' (p. 195). Although it makes sense to use patients' own accounts of their problems, one could argue that this approach is too simple as it narrows the concept of sexual dysfunction down to whether the patient is able to perform sexually or not, and does not specify the types of problems the participants are experiencing. In the study by Dossenbach et al. (2005), the patients' self-reports of sexual problems were also compared to their psychiatrists' assessment, which showed a systematic underestimation of sexual dysfunction (pp. 197-198). This makes self-rating questionnaires more favourable compared to the judgement of mental health professionals. In the study by Dossenbach et al. (2005) significantly more males than females were found to have a sexual dysfunction regarding sexual desire, based on the assessment from the psychiatrist (Ibid.). Males were also found to have significantly more problems with orgasm in comparison with females (Ibid.).

Another study that contributes to the estimate made in the review by Baggaley (2008) is the study by Macdonald et al. (2003). Macdonald et al. (2003) used a self-made questionnaire which had not been validated but did include gender-specific questions that addressed both desire, arousal, performance and satisfaction in patients with schizophrenia (p. 50). Macdonald et al. (2003) found that at least one sexual dysfunction was reported by 82 % of male participants, and 96 % of female participants (p. 50). Macdonald et al. (2003) also concluded that the pattern of sexual dysfunctions differs between males and females with schizophrenia (p. 50). Males had problems with sexual desire, erection, premature ejaculation and less satisfaction with orgasm, while females mostly reported problems with sexual desire (Macdonald et al., 2003, p. 50).

The prevalence rates found by Macdonald et al. (2003) and Dossenbach et al. (2015) are high compared to the prevalence of sexual dysfunction in the overall population, which has been estimated to be between 10 % and 15 % (Kockott & Pfeiffer, 1996 as cited in Acuña et al., 2010, p. 3414). Contrary to the findings by Macdonald et al. (2003), Dossenbach et al. (2015) and Cutler

(2003) report that the frequency of sexual dysfunction is higher in males with schizophrenia (Dossenbach, 2015, p. 198 and Cutler, 2003, p. 69). Bram and et al. (2014) also examined gender difference in the prevalence of sexual dysfunction in people with schizophrenia using the long version of the CSFQ and did not find a between-gender effect (p. 66). Furthermore, Bram et al. (2014) found that the most frequent sexual dysfunction was lack of pleasure. Bram et al. (2014) also refer to several other studies that did not find a between-gender difference in prevalence of sexual dysfunctions. For instance, they mention Fan et al. (2007) who also employed the long version of the CSFQ and found that 60 % of the male participants (N=22) and 80 % of the female participants (N=16) had impairment in overall sexual functioning (Fan et al., 2007, p. 123). In line with the studies carried out by Bram et al. (2014) and Fan et al. (2007), Liu-Seifert et al. (2009) also did not find a significant between-gender difference in the prevalence of sexual dysfunction among people with schizophrenia, where 59 % of their female participants (N=147) and 60 % of the male participants (N=255) had a sexual dysfunction (p. 47). Liu-Seifert et al. (2009) also employed the CSFQ, and also The *Global Impression of Sexual Function* (GISF) that assesses desire, arousal, orgasm and overall sexual function.

Unlike the above-mentioned studies, there are studies that have found a significant between-gender difference in the prevalence of sexual dysfunction among people with schizophrenia. In addition to Dossenbach et al. (2005), for example, Bhui, Puffet and Herriot (1995) found that 62 % (n = 21) of the male subjects who had schizophrenia reported current sexual or relationship problems, which was significantly more than the females, where only 25 % (n = 4) reported current sexual or relationship problems (p. 73). However, besides the small number of participants, Bhui, Puffet and Herriot (1995) did not use a standardised measure of sexual dysfunction but had the researcher conduct semi-structured interviews with patients about current sexual or relationship problems (p. 74). The researcher would then categorize the patient's problem according to the following problem areas for men: Reduced desire, erectile failure, premature/absent/delayed ejaculation, relationship problem or other (Ibid.). For women the problem areas were categorized as: Reduced desire, reduced arousal, vaginismus, absent/delayed orgasm, dyspareunia, relationship problem or other (Ibid.).

Bhui, Puffet and Herriot (1995) argue that although the interviews were tolerated by participants, the use of standardised questionnaires is preferable in order to better define the degree

of sexual dysfunction (Bhui, Puffet & Herriot, 1995, p. 76). In addition, the researchers themselves point out that the effect could be caused by the fact that male participants are overrepresented in the sample (Ibid.).

Contrary to Bhui, Puffet and Herriot (1995) Fortier et al. (2003) found sexual dysfunction to be significantly more prevalent in their female participants with schizophrenia. The females were found to masturbate less often, feel less sexual desire in comparison with the male participants with schizophrenia (Fortier et al., 2003, p. 559). Fortier et al. (2003) had participants fill in a self-report questionnaire on sexual history, sexual activities, sexual dysfunctions, and menstrual problems. In addition, Fortier et al. (2003) also had participants fill in the *Multidimensional Sexuality Questionnaire* (MSQ), which is a questionnaire that assesses a person's perceptions about self-esteem, anxiety, depression, and satisfaction related to sex (Snell, Fisher and Walters, 1993, p. 55). However, one limitation of the study by Fortier et al. (2003) is that it is unclear how they defined the criteria for sexual dysfunction, and the sample size was small with only 20 female participants and 25 male participants with schizophrenia (p. 561).

Also Nakhli et al. (2016) found that females with schizophrenia had significantly more sexual dysfunction regarding arousal and orgasm (p. 1).

On the contrary, Harley, Boardman & Craig (2010) found that females with schizophrenia experienced significantly more problems with sexual desire, while they found that males were more likely to report problems in arousal compared to females (pp. 761-762). In the review by Kelly and Conley (2004), they also had mixed findings regarding between-gender difference in the pattern of sexual dysfunction. The most commonly reported disturbances were related to erectile and ejaculation difficulties in males (Kelly & Conley, 2004, p. 768). In females, the most commonly reported disturbances were related to dysfunction in desire and orgasm (Ibid.).

One of the methodological challenges in assessing prevalence and gender bias of sexual dysfunction in people with schizophrenia is that it remains unclear whether the sexual dysfunction is a cause of the disorder or due to other factors. In order to overcome this obstacle there has been a recent development within the field where the prevalence of sexual dysfunction is assessed in unmedicated patients with schizophrenia. One such study was carried out by Dembler-Stamm et al. (2018) where

participants were asked to fill in the *Derogatis Inventory for Sexual Function* self-rating where age and gender were accounted for (Dembler-Stamm, 2018, p. 1).

The results showed that the unmedicated schizophrenia patients had significantly reduced sexual activity and less pleasure during sexual activity compared to a matched group of healthy control individuals (Ibid.). This indicates that sexual dysfunction is not only a result of antipsychotic medication but an inherent feature of schizophrenia (Ibid.). Additionally, gender was observed to influence 'sexual cognition and fantasy arousal' and 'orgasm' with males having higher scores in both domains, signifying better sexual functioning. The limitations of this study are that the male participants (N =17) were overrepresented compared to female participants (N = 2) and that the total sample size was small (N = 19). In a related but also somewhat different study by Marques et al. (2012), unmedicated people with prodromal signs of schizophrenia (the UHR group) were compared with medicated people with first-episode psychosis and a matched control group (p. 131). Results in the Marques et al. (2012) study showed 50 % of the UHR group had sexual dysfunction, and 65 % of the people in the first-episode psychosis group had sexual dysfunction, while only 21 % of the control group had sexual dysfunction (Ibid.).

An overview of the studies in the literature review that have examined gender difference in sexual dysfunction among people with schizophrenia is given in table 1.

Studies that have examined gender impact on sexual dysfunction in people with schizophrenia			
Studies where sexual dysfunction was significantly more prevalent in males	*Studies where sexual dysfunction was significantly more prevalent in females*	*Studies that did not find a gender effect*	*Studies that showed mixed gender effects*
Dossenbach et al. (2005)	Fortier et al. (2003)	Bram and et al. (2014)	Harley, Boardman & Craig (2010)
Bhui, Puffet & Herriot (1995)	Nakhli et al. (2016)	Fan et al. (2007)	
		Liu-Seifert et al. (2009)	

Table 1

In summary, results from previous studies are conflicting, some are based on questionable methods, and therefore somewhat insufficient to clarify how prevalent sexual dysfunction is among people with schizophrenia and whether (and perhaps how) gender has an impact.

Hypothesis

The following hypotheses are derived from findings in previous studies as accounted for in the literature review.

Hypothesis 1:

> Based on findings from previous studies it is hypothesized that the prevalence of sexual dysfunction will be 30-80%.

Hypothesis 2:

> It is expected that the frequency of sexual dysfunction will be higher for male participants than female participants.

Hypothesis 3:

> It is hypothesized that the most frequent sexual dysfunction for males is orgasm and arousal impairment, while the most frequent dysfunction for females is hypothesized to be desire and orgasmic dysfunction.

Hypothesis 4:

> If there is a gender difference in frequency on sexual dysfunction, it is hypothesized that the frequency will be significantly higher for male participants than female participants.

Theory and clarification of concepts

In the following, a historical outline of the concept of schizophrenia is given, followed by the diagnostic criteria and a description of the course of the disorder. Then the concept of sexual dysfunction and theories that describe the different phases of the sexual response cycle are outlined. These theories form the basis of the measure (CSFQ-14) used in this study. Finally, the neural mechanisms that underlie the different phases of the sexual response cycle are described.

History of the concept of schizophrenia

To introduce the concept of schizophrenia, a brief sketch of the history of the notion is in order. According to Shean (2004), the physician Morel was the first to use the predecessor concept of schizophrenia, *demence precoce* in 1852 (p. 8). One of the earliest cases was described by Morel (Ibid.). This case concerned a young man who gradually became withdrawn and melancholic and progressively lost his cognitive abilities (Ibid.). Later the psychiatrist Kahlbaum studied the course of psychoses over time and categorized the symptoms (Ibid.). In 1863 Kahlbaum described two patterns of psychotic symptoms: "hebetic paraphrenia" (or as Hecker according to Shean (2004) later in 1871 termed it: Hebephrenia) with hallucinations, delusions and bizarre behaviour, and catatonia with extreme disturbance in movement (Shean, 2004, p. 8). In 1896 Emil Kraepelin broadened Morel's *demence precoce* by including Kahlbaum's notion of catatonia and hebephrenia and adding the category paranoia. He concluded that all three were subtypes of a single disorder - *dementia praecox*, which resulted in progressive deterioration of mental abilities (Shean, 2004, p. 9). In 1899, Kraepelin provided more detailed descriptions of *catatonia*, *hebephrenia* and *paranoia*, and stated that the three could occur over time in the same patient (Shean, 2004, p. 9). Later in

1913, Kraepelin included a fourth group – *paraphrenia* to describe individuals who experience delusions (Shean, 2004, p. 10).

In 1919, Kraepelin also tried to describe two core features of *dementia praecox* – which were later termed negative symptoms and positive symptoms (Ibid.). Kraepelin described the negative symptoms as a weakening of emotional activities which he meant were the motivating force of free will (Shean, 2004, p. 10). Kraepelin described the positive symptoms as a loss of connection between intellect, emotion and free will (Ibid.). Kraepelin also described prodromal signs of *dementia praecox* to include a changed pattern of sleep, appetite and *"(…) sensory disturbances, loss of affective control, irritability, withdrawal or bursts of energy, confusion, giddiness or preoccupation with cosmological beliefs"* (Shean, 2004, p. 11). Central to Kraepelin's description is that the course of the disorder is a progressive deterioration of cognitive functions (Ibid. p. 12-13). Shean (2004) points towards that this is also a point of criticism, as it has been found that not all patients experience progressive deterioration (p. 13). In fact, some patients have periods of recovery (Ibid.).

Later, Kraepelin's definition of schizophrenia as *dementia praecox* was changed and challenged by Eugen Bleuler in 1908, who was the first to name the disorder *schizophrenia,* which can be translated to "split mind" (Barnett, 2018, p. 648). Bleuler's concept of schizophrenia draws on Kraepelin's notion of *dementia praecox*, but instead of focusing on observing and recording symptoms of the disorder, Bleuler instead theorised an underlying brain disease and sought to interpret the meaning of schizophrenic symptoms and the disease (ibid.). In addition, while Kraepelin's definition of schizophrenia was very narrow, Bleuler broadened the definition, which led to an increase in the number of diagnosed cases (Shean, 2004, p. 21). When antipsychotic medications came out in the 1950s, new debates emerged as well about the underlying cause of schizophrenia (Barnett, 2018, p. 648). Up until the 1950s, the dominant theoretical explanation was set forth by psychoanalysts, who believed that schizophrenia was a failure of ego development caused by family tension and a "schizophrenogenic mother" (Ibid.). Presently, schizophrenia is understood as a neurodevelopmental disorder caused by an interaction between a hereditary vulnerability and environmental stressors (Os, Kenis & Rutten, 2010, p. 203).

Schizophrenia – the diagnostic criteria

There are various diagnostic systems, of which the *International Statistical Classification of Diseases and Related Health problems 10th revision* (ICD-10) is the diagnostic manual primarily used in Denmark. According to ICD-10, schizophrenia is not a single disorder but can be viewed as a cluster of multiple related disorders, also known as the schizophrenia spectrum (ICD-10, 2016, F20). Accordingly, the schizophrenic disorders are characterized by fundamental and characteristic distortions of thinking, perception and affects that are inappropriate or blunted (Ibid.). The course of the schizophrenic disorders can be continuous, episodic with progressive or stable deficits or there can be one or more episodes with complete or incomplete remission (Ibid.).

In the following, a Danish adaptation of the WHO ICD-10 from 1992 is followed in order to describe the diagnostic criteria of schizophrenia (WHO ICD-10, 2018). There are three ways of diagnosing schizophrenia according to this version of the ICD-10 (Ibid., p. 66). The first way of making a diagnosis of schizophrenia requires at least one of the following *first rank symptoms* to be present: The person must have an experience of thoughts being influenced, and/or have third person hearing hallucinations, and/or experience that his/her actions or feelings are being controlled, and/or experience that his/her body is being influenced, and/or delusional perceptions (Ibid.). The second way to make a diagnosis of schizophrenia requires lasting bizarre delusions (bizarre is being defined as impossible and culturally unacceptable delusions) (Ibid.). The third way to make a diagnosis of schizophrenia requires at least two of the following symptoms: Lasting hallucinations with delusions that do not contain any affective content, and/or lingual thought intrusions, and/or catatonic behaviour, and/or negative symptoms (Ibid.). It is a requirement for all three ways that symptoms must be present for at least a month, the symptoms cannot have organic aetiology and schizoaffective disorder needs to be excluded (Ibid.). Figure 1 summarizes the diagnostic criteria for schizophrenia.

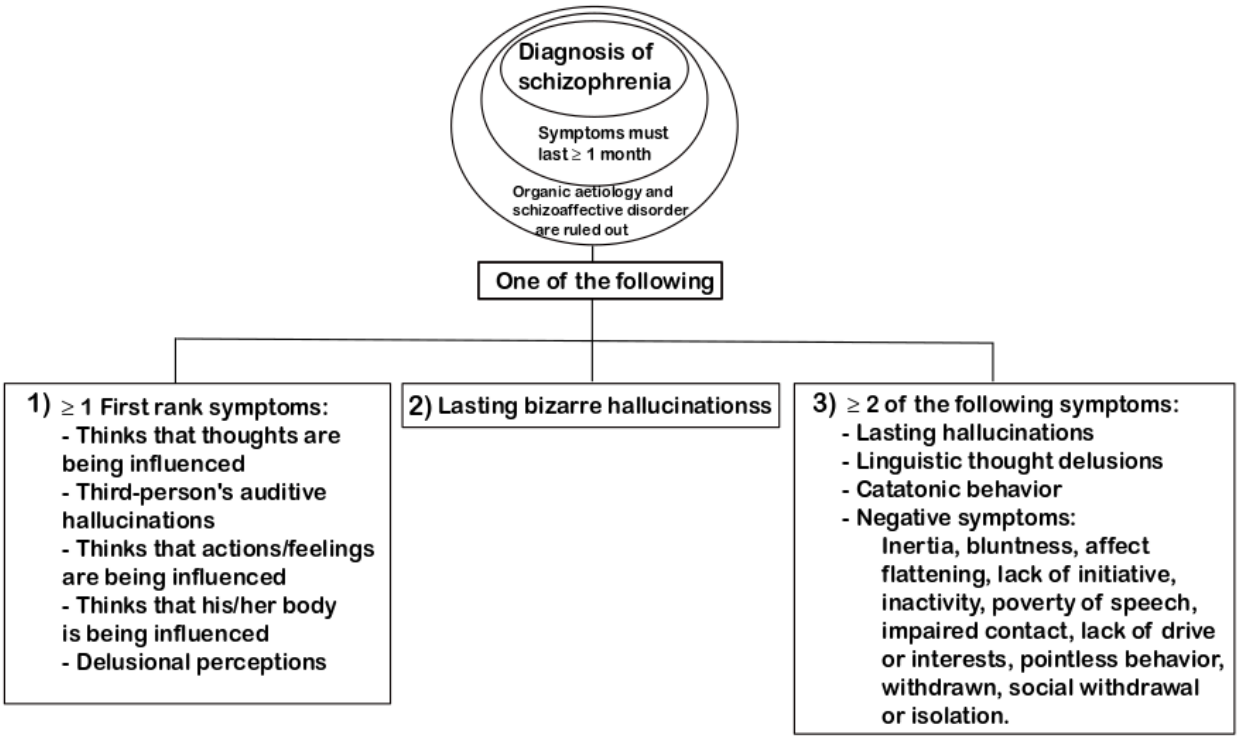

Figure 1 - The diagnostic criteria for schizophrenia based on WHO's ICD-10 (2018, p. 66-67).

The different phases of schizophrenia

Schizophrenia progresses through three phases according to Shean (2004, p. 43). Two of these have already been described by Kraepelin (Shean, 2004, p. 11). In the following, more recent findings on this matter are briefly reviewed. The first phase, called *the prodromal phase* usually begins before the person is hospitalized and according to Shean (2004) these early signs may continue and gradually increase in intensity over years before psychosis sets in (p. 44). In a study by Moukas et al. (2010) 38 prodromal symptoms were identified in total, of which 5 prodromal symptoms were significantly frequent (p. 546). In males, these 5 symptoms included: "*Odd behaviour, lack of appetite, aggressiveness, poverty of speech and isolation"* (Moukas et al., 2010, p. 548). In females, the 5 most frequent prodromal symptoms were*: "Odd beliefs/magical thinking, hyperacusia, vague speech, over-elaborated speech and inappropriate affect"* (Moukas et al., 2010, p. 548). In *the acute phase* of schizophrenia where psychosis sets in, the individual commonly experiences both positive and negative symptoms (Shean, 2004, p. 44). According to Shean (2004), positive symptoms include an increase of certain symptomatic behaviours, while negative symptoms include deficit behaviours (p. 50). Unlike Kraepelin's view, the outcome does not always progress into

deterioration (Shean, 2004, p. 44). The final phase is *the residual phase* where positive symptoms decrease, but the negative symptoms often remain (Ibid.). According to Shean (2004), a person with schizophrenia can have one or more of these cycles throughout life (p. 44-45).

The concept of sexual dysfunction

The Oxford Dictionary of Psychology defines sexual dysfunctions as a category of mental disorders that involve: *"Disturbance in sexual response cycle or pain associated with sexual intercourse"* (Colman, 2009, p. 693). According to ICD-10 these sexual dysfunctions include: Lack of sexual desire, sexual aversion, genital dysfunction (inability to have an erection for males and vaginal dryness during intercourse for females), the inhibition of orgasm (delayed or absent), premature ejaculation, vaginismus, dyspareunia, heightened sexual activity, other non-organic sexual dysfunction and unspecified non-organic sexual dysfunction (ICD-10, 2018, p. 129-131). While there are numerous different theories of sexuality, the main objective of the present study is to determine the prevalence of sexual dysfunction among people with schizophrenia and explore if there exists a between-gender difference in the prevalence of sexual dysfunction. For that reason, it makes sense to employ the biological perspective where functional aspects of sexuality are emphasized. Therefore, the three phases of the sexual response cycle are described in the following section as this will help illuminate what is being measured with the CSFQ-14. The human sexual response cycle will be described both in terms of earlier theories and more recent attempts.

The human sexual response cycle

The first theory that described the human sexual response cycle was proposed by Moll in 1912, and had four phases as displayed in figure 2 (Levin, 2017, p. 40).

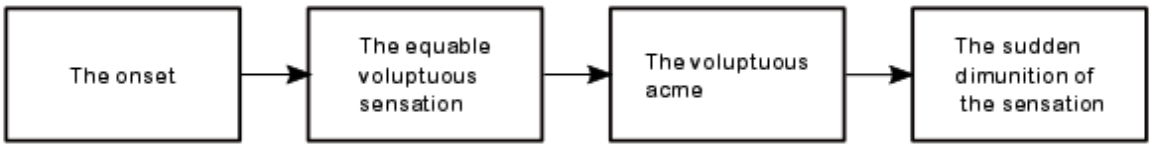

Figure 2. The four-phase human sexual response model of Moll (Levin, 2017, p. 40).

Moll's model is not gender-specific and is therefore seen as applicable to both men and women. *The equable voluptuous sensation phase* equals an arousal phase while the *voluptuous acme phase* represents the orgasm phase and *the sudden dimunition of the sensation phase* represents how the act has terminated (Levin, 2017, p. 40).

In 1966 another theory appeared. Set forth by Masters and Johnson, the EPOR model of the sexual response cycle also categorizes four phases, described as excitation (E), plateau (P), orgasm (O) and resolution (R). While the EPOR model was quite successful, the plateau phase was criticized by Robinson in 1976 for being redundant as sexual excitement does not plateau but is rising until the orgasmic climax (Levin, 2017, p. 41). Therefore, the EPOR model was renamed EOR (Ibid.).

Then criticism was directed towards the fact that the EOR model lacked a phase, where the individual becomes aware of a desire for sexual activity (Levin, 2017, p. 41). The tri-phasic theory of the human sexual response cycle was therefore proposed by Kaplan, where a phase of desire (D) was included, while keeping the phases of excitation (E) and orgasm (O) proposed by Masters and Johnson in 1966 (Ibid.). According to Levin (2017), Kaplan's tri-phasic theory kept the resolution phase, and Levin therefore termed Kaplan's theory the DEOR model (pp. 41-42). However, in Kaplan's *Disorders of sexual desire* from 1979, she does not mention a resolution phase. Therefore, in the following, Kaplan's tri-phasic theory of sexual response will be referred to as Kaplan's theory, instead of DEOR.

Kaplan (1979) states that the three phases of desire, arousal (arousal and excitement are used interchangeably) and orgasm are physiologically interconnected (p. 6). However, she also states that they are governed by separate neurophysiological systems, which is why it is possible for a person to experience dysfunction in either of the three phases independently or all at once (Ibid.). She further argues that certain kinds of dysfunctions can disturb the entire sexual response cycle but often only one component is disrupted (Kaplan, 1979, p. 6). Sexual desire is defined by Kaplan as an appetite or a drive which is produced by the activation of a specific neural system in the brain, although it was not known at the time what the neuroanatomic bases for sexual desire was (Ibid., p. 9). The arousal phase differs for males and females (Ibid., p. 16). Males experience an erection where the penis is enlarged due to a net increase of blood flow, which creates a high pressure within the penis (Kaplan, 1979, p. 16). The erectile response is caused by both the parasympathetic and the sympathetic system (Ibid.). In females, there is a swelling and blushing of the labia and the tissues

that surround the vagina, while the vagina also lubricates (Kaplan, 1979, p. 17-18). Also this response is caused by the parasympathetic nervous system (Ibid.). When Kaplan wrote her book on this, the neural basis of the arousal phase had not yet been established. The neural basis of the sexual response cycle is the topic of the next section. The orgasm is a genital reflex which is determined by spinal cord neural centres (Kaplan, 1979, p. 19). The orgasm consists of muscular contractions in both males and females (Ibid.). In males, the orgasm consists of two subphases of coordinated reflexes, also called: Emission and ejaculation (Ibid.). Emission is the reflex contraction and is followed by contractions where seminal fluid is ejaculated, and it is these contractions that are experienced as a pleasurable sensation or orgasm (Ibid., pp. 19-20). In the female orgasm, there is equally a rhythmic contraction which is accompanied by a pleasurable sensation or orgasm (Kaplan, 1979, p. 20).

In 2001 Levin added a second phase of desire, which is activated by arousal and therefore a reactive desire phase (D2) (Levin, 2017, pp. 41-42). Levin united the EOR model with Kaplan's tri-phasic model and renamed it the D1D2EOR model (Ibid.). In the following the male and female sexual response models are illustrated, based on the D1D2EOR model by Levin (Ibid.).

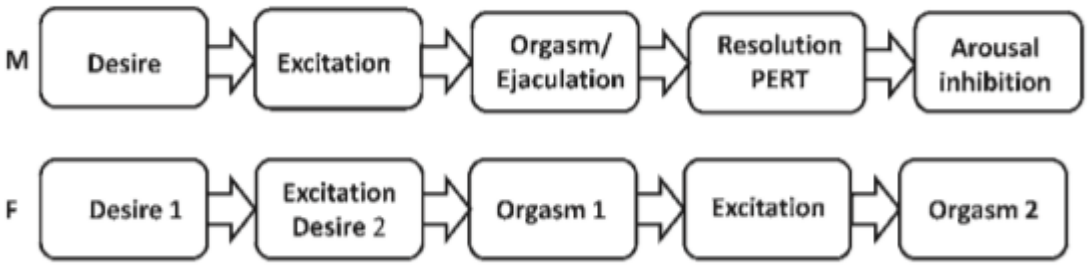

Figure 3 - The female (F) and male (M) sexual response models based on the D1D2EOR *model (Levin, 2017, p. 44).*

As displayed in figure 3, there are differences in how males and females experience the sexual response cycle. One important difference between the male and female sexual response cycles is that females can have multiple orgasms, whereas the male's arousal is inhibited for a longer period. The models described until now, was accused of being too simplistic and their linearity was deemed

inadequate and therefore, gender-specific sexual response cycles were developed (Levin, 2017, p. 43). The next important step in describing the female sexual response was set forth by Basson in 2000 (Ibid.). Basson's conceptualization of a biopsychosocial model of the female sexual response, also known as the "circular model", is displayed in figure 4.

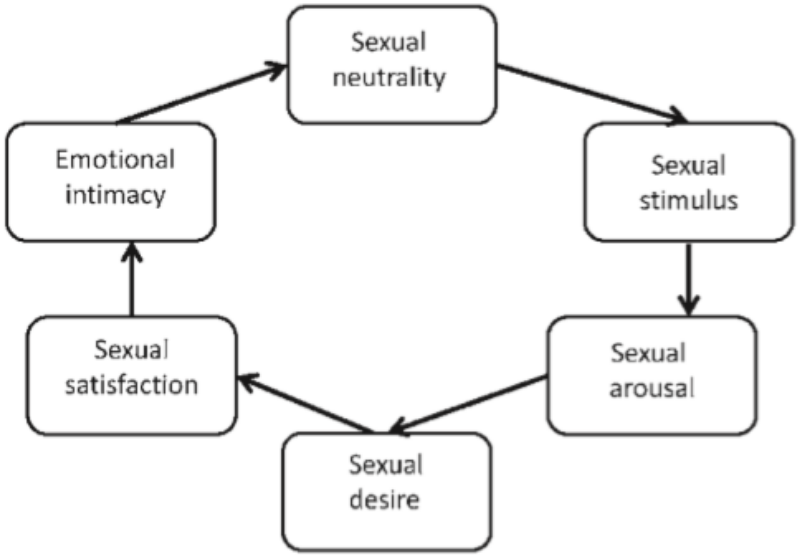

Figure 4. The Basson circular model of the female sexual response from 2000, (Levin, 2017, p. 43).

According to Basson's circular model, the female sexual response starts with sexual neutrality. Then a sexual stimulus is presented which causes sexual arousal, and is followed by sexual desire, which leads to sexual satisfaction and then emotional intimacy. This is in contrast with Kaplan's tri-phasic theory where the desire phase precedes the arousal phase. Moreover, while other models suggest that orgasm is the peak of the sexual response, Basson's circular model suggests that sexual satisfaction is not dependent on the woman's orgasm, and that emotional intimacy might be as rewarding as a sexual orgasm. Basson argued in 2000, that while women in a new sexual relationship probably follow the Kaplan model of sexual responses, women in long term relationships are probably more prone to follow her circular model of sexual response (Levin, 2017, p. 43). There is some merit in including emotional intimacy as a simultaneous gain of sexual activity besides the pleasurable sensation of orgasm, but it is debatable whether there are significant differences between females in new relationships versus females in long-term relationships with

respect to the sexual response cycle. Furthermore, it is disputable that arousal should come before desire. In order to explore how well the models, described until now, represent the actual experience of the sexual response cycle in males and females, a group of participants were asked which model best fitted their experience of their sexual behaviour (Giles & McCabe, 2009 as cited in Levin, 2017, p. 43). Giles and McCabe (2009) made an online survey which showed that linear models fitted better with women without sexual dysfunction, while the circular model fitted women with sexual dysfunction better (p. 2761). In a more recent study which was also based on an online survey, Giraldi, Kristensen and Sand (2015) found that in men, 48,5 % endorsed the EOR model, 38,3 % endorsed the Kaplan model while 5,4% endorsed the Basson model, and 7,3 % endorsed none of the models (p. 116). In women, 34 % chose the Kaplan model, 28 % chose the EOR model, 25,6 % chose the Basson circular model and 12,5 % chose none of the models (Giraldi, Kristensen & Sand, 2015, p. 116). It was also found by Giraldi, Kristensen and Sand (2015) that most men and women without sexual dysfunction who were satisfied with their sexual life preferred the linear models over the circular model (Ibid.). These results suggest that Kaplan's model is more adequately describing the sexual response cycle of individuals who do not have a sexual dysfunction.

The neural mechanisms of sexual behaviour

When Kaplan formulated her triphasic theory, knowledge of the neural mechanisms of the sexual response cycle was sparse, especially regarding the desire phase. Although some advances have been made in describing sexual behaviour, it was stated in a recent review by Calabrò et al. (2019) that how desire, arousal and orgasm are mediated, is not fully understood yet (p. 1). The reason for this is that it is a complex interaction between structures in the central nervous system (CNS) and the peripheral nervous system (PNS) that are responsible for an individual's engagement in sexual behaviour (Ibid., p. 2). This complex interaction is not completely understood yet. Even so, there are findings that indicate which neural mechanisms are involved in the sexual response cycle (Ibid.).

The neural mechanisms that have been found to be active in the desire phase are: The reward system, the amygdala, the prefrontal cortex, the cingulate cortex, the septal region and the insula (Ibid., p. 3). The reward system is involved in the positive sexual reinforcement through dopaminergic release and consists of the ventral tegmental area (VTA) which has projections to

nucleus accumbens through the dopaminergic mesolimbic pathway (Calabrò, 2019, p. 3). The VTA also projects to the prefrontal cortex (Ibid.). The amygdala is a group of nuclei located in the temporal lobe and is connected to both cortical and subcortical structures (Ibid., p. 5). The amygdala is involved in down-regulating sexual desire. This knowledge is based on studies that found lesions on the amygdala to cause hypersexuality (Lanska, 2018 as cited in Calabrò et al., 2019, p. 5). The prefrontal cortex is involved in complex cognitive behaviours, the control of behaviour and also inhibition of sexual behaviour (Ibid., p. 7). The cingulate cortex can be divided into an anterior, a middle and a genual subregion (Ibid.). The anterior cingulate cortex has been found active during processing of erotic stimuli (Ibid.). The middle cingulate cortex has been found active during arousal while activity in the genual subregion of the cingulate cortex has been found to correlate negatively with arousal (Ibid.). The insula is mainly active during the desire phase but during the arousal phase posterior parts of the insula are also active (Ibid.). The arousal and orgasm phases are mediated through an activation of the hypothalamus (Ibid., p. 3). The hypothalamus consists of several nuclei that either stimulate or inhibit hormone production (Ibid., p. 5). Additionally, the anterior hypothalamus has been found to be smaller in females and homosexual males, which indicates that sexual orientation has a biological basis (Brunetti et al., 2008; LeVay, 1991; Paredes & Baum, 1997; Swanson & Petrovich, 1998 as cited in Calabrò et al., 2019, p. 5).

In the following, the existing knowledge about the neurochemical mechanisms and hormonal modulators of the sexual response cycle is outlined based on the review by Calabrò et al. (2019). The release of the neurotransmitter serotonin within the CNS, has an inhibitory effect on sexual desire, arousal (erectile function and vaginal lubrication) orgasm/ejaculation (Calabrò et al., 2019, p. 9). The neurotransmitter dopamine has been found to be released during sexual activity and disinhibits genital reflexes and by doing so, acts as a facilitator of the motor activity of copulation (Ibid., p. 10). Dopamine agonists have been found to successfully treat erectile dysfunction (Ibid.). Calabrò et al. (2019) state that several studies have found dopamine to also be triggering sexual motivation (p. 4). The neurotransmitter acetylcholine has been found to be promoting penile erection along with the stress hormone norepinephrine, and histamines (Ibid.). Histamine also modulates sexual desire (Ibid.). At the hormonal level, androgens stimulate and maintains sexual function (Ibid.). Furthermore the hormone estradiol increases or decreases what is referred to as "male-typical" behaviours (Ibid.). Both of the aforementioned hormones act as arousal-increasing (Ibid., p. 9). The hormone prolactin which gives a gratifying feeling after orgasmic climax can also cause impotence and loss of sexual desire if the concentration of prolactin is high in blood levels

(Calabrò, 2019, p. 9). In essence, there is substantial knowledge about how components of the sexual response cycle are mediated through the release of neurochemical transmitters and hormonal production caused by an interplay between the CNS and the PNS.

Summary

Bleuler was the first to use the concept schizophrenia but based this on a lot of Kraepelin's symptom descriptions. Based on ICD-10, schizophrenia is characterized by positive symptoms such as episodes of hallucinations and delusions, but also negative symptoms such as lack of interest, and withdrawal. Although the course of the disorder varies, a prodromal phase, an acute phase and a residual phase have been identified. According to ICD-10, sexual dysfunction can be defined as a disturbance in the sexual response cycle and the experience of pain during intercourse. The human sexual response cycle has been described in numerous ways and both linear and circular models have been developed to describe it. However, the D1D2EOR built on Kaplan's triphasic theory best describes what is measured in the CSFQ-14, where both desire, arousal/erection and orgasm/ejaculation are being assessed. This division of the sexual response cycle enables the understanding that sexual impairment can happen in any of the three phases. Ultimately, it enables an in-depth understanding that guides the aim of this study, which is to create an empirical basis to determine the prevalence of sexual dysfunction among people with schizophrenia and to clarify if (and perhaps how) gender has an influence.

Methods

In the following the research design is introduced. After this, some ethical considerations are discussed, and it is described how participants were recruited. Furthermore, the CSFQ-14 questionnaire and the procedure are described. Finally, the choice of statistical analysis is discussed.

Research design

To determine the prevalence of sexual dysfunction among a sample of people with schizophrenia, test results were categorized according to given cut-off scores and the percentage frequency of sexual dysfunction was calculated. In order to determine if there is a between-gender effect on the

prevalence of sexual dysfunction among people with schizophrenia a cross-sectional design was employed. In a cross-sectional design or group differences study, participants were allocated to two groups according to gender, male or female. Hence, the independent variable of this study is gender. There are several dependent variables that were measured – a total score on CSFQ-14, and 5 subscale scores in the domains: Pleasure, Desire/Frequency, Desire/Interest, Arousal/Erection and Orgasm/Ejaculation. Based on the scores of each of the domains and the total score on CSFQ-14 new dependent variables were created. The calculated scores were compared to a cut-off score, categorising them as normal sexual functioning or having a sexual dysfunction. Therefore, categorical variables with two levels were created for each of the 6 measures, where the levels correspond to: Normal sexual functioning or sexual dysfunction.

Ethical considerations

When dealing with a vulnerable population, such as people with schizophrenia, it is important to consider the ethical issues that may arise when conducting research. Especially when studying a sensitive topic like sexual functioning. One ethical issue is whether the research conducted will contribute to further stigmatization of the vulnerable population in question. Although this is a risk, it can be argued that the knowledge the research can give has the potential to improve existing therapeutic interventions, treatment compliance and most importantly, improve the quality of life of people with schizophrenia. This emphasizes the need of this issue to be acknowledged and addressed. Additionally, when dealing with private matters such as sexual functioning, it is important to do so in a manner that protects the participants' privacy rights. Therefore, this study was carried out as an online survey which was completely anonymous, meaning that no personally identifiable data was collected. In order to protect the participants' rights of online privacy it is mandatory that the media used for data collection complies with GDPR. The data processor which was used in this survey state that their service is in accordance with the new GDPR regulations, and no information about participants' IP-addresses were recorded.

Furthermore, during this project the regional committee of research ethics was contacted, who deemed it unnecessary to register the study, as it is carried out as an online survey and is not per definition a health scientific study. It is equally important that the questionnaire used assesses an individual's sexual functioning in a respectful manner. The CSFQ-14 is a reliable, well-validated and standardised questionnaire that has been tested on a vulnerable group, namely people

with depression, and is therefore deemed non-intrusive or offensive and suitable to be used with people suffering from schizophrenia (Keller, McGarvey & Clayton, 2006, p. 44). Participants were informed about the purpose of the study on the first page of the questionnaire, and participation therefore signifies consent. Withdrawing from the online survey corresponds to withdrawal of consent, which means that any data gathered, is deleted.

Recruitment of participants

The participants of this study were recruited through three social media groups on Facebook and two organizations. One of the groups mediates contact between researchers looking for participants and people who wish to volunteer for studies. The two other Facebook groups were social forums. One is specifically created for people with schizophrenia, schizotypy, and relatives (Hjerterum). The other was a forum for people with any psychiatric disorder (Psykiske Sygdomme). The questionnaire was also sent to two organizations: Skizofreniforeningen that works specifically with people who have been diagnosed with schizophrenia and SIND which is an organization that among other things offers psychoeducation and courses for people with a psychiatric diagnosis.

The CSFQ-14 questionnaire

According to Kelly and Conley (2004) there are seven criteria to consider when choosing a questionnaire to assess sexual functioning in psychiatric patients (p. 770):

1) The questionnaire should be gender-specific (Ibid.). This makes sense, as the sexual response cycle differs between males and females.

2) The questionnaire should address phase-specific function (Ibid.). This criterion has its challenges as the phases differ depending on the employed theoretical framework.

3) The questionnaire should be brief (Ibid.). This is an important argument, as lengthy questionnaires might be experienced as troublesome to participants who, as a consequence might refuse or cancel their participation.

4) The questionnaire should be perceived as non-intrusive by the patient (Ibid.). This is especially important if participants are even to consider partaking in a study.

5) The questionnaire should have the ability to separate illness from medication effects (Kelly & Conley, 2004, p. 70). This is important, although somewhat difficult to carry out in practice.

6) The questionnaire should be able to monitor changes over time (Ibid.).

7) The questionnaire should assess premorbid and lifelong function compared with current state of functioning (Ibid.).

Kelly and Conley (2004) conclude that the (long version of) the CSFQ may be the most appropriate measure to use with patients suffering from schizophrenia (Ibid.). Even so, because the CSFQ is a lengthy and somewhat complicated questionnaire, the short-form version (the CSFQ-14) was chosen instead, to operationalize sexual functioning in this study (Keller, McGarvey & Clayton, 2006, p. 43). The CSFQ-14 questionnaire uses a 5-point Likert scale for the participants to answer, where 1 point is the lowest value of a score and 5 is the highest value of a score. Higher scores reflect higher sexual functioning (Ibid., p. 45). The questionnaire has 5 subscales that include assessment of Kaplan's three phases of the sexual response cycle, but also includes a measure of experienced pleasure. Additionally, the CSFQ-14 divides the desire phase according to frequency and interest. The pleasure subscale assesses present enjoyment of sex life in comparison with past enjoyment and includes only one item (Ibid.). The desire/frequency subscale assesses frequency of desire and frequency of sexual activity and includes two items (Ibid.). The desire/interest subscale assesses frequency of sexual thoughts and fantasies and includes three items (Ibid.) The arousal/erection subscale assesses frequency of arousal, ease of arousal and whether the female experiences adequate vaginal lubrication (Ibid). The arousal/erection subscale also assesses whether the male experiences adequate erection during sexual activity (Ibid.). The arousal/erection subscale includes three items in both the male and female version of the CSFQ-14 (Ibid.). The last subscale concerning orgasm/ejaculation, assesses a person's ability to achieve orgasm, frequency of orgasms and the degree of pleasure a person experiences when he/she has an orgasm (Ibid.) The orgasm/ejaculation subscale includes three items (Ibid.).

In item 10 it is asked how often the person experiences to lose interest and in item 14 it is asked how often the person experiences pain during intercourse. For these two items, lower frequency equals higher sexual functioning (Ibid.). Items 10 and 14 are included in the total CSFQ-14 score but are not included in any of the subscale scores. When the questionnaire is completed a

total (or global) CSFQ-14 score can be calculated. This score can be compared with a given cut-off used clinically, which determines whether the person suffers from sexual dysfunction or not (Clayton, 1998, p. 3). Similarly, cut-off scores exist for each of the five subscales.

Procedure

The CSFQ-14 questionnaire was used and converted into an online survey (See appendix 2 for the Danish translation of the CSFQ-14). The website 'Online Survey' ('Online Undersøgelse' in Danish) was used to carry out the survey. Participants were first asked about gender (female or male). They were then informed that a diagnosis of schizophrenia is a prerequisite for participation, and then they were asked to complete the questionnaire. Each response is graded with a value from 1-5 and point sums were calculated for the total score and for each subscale. (All the original items are displayed in Appendix 1, Clayton, 1998, p. 3). To determine whether the participant has a sexual dysfunction, gender-specific scoring protocols were employed (Ibid.). According to Clayton (1998) if a female has a score that is equal to or below the following cut-off points, it is indicative of sexual dysfunction (p. 3). See table 2 for cut-off scores for females.

Cut-off scores for the CSFQ-14-F			
Scale	*Questionnaire items*	*Cut-off score*	*Range (min. score and max. score)*
Total CSFQ-14-F score	1-14 (All items added up)	41	14-70
Sexual desire/frequency score	2+3	6	2-10
Sexual desire/interest	4+5+6	9	3-15
Sexual pleasure	1	4	1-5
Sexual arousal/excitement	7+8+9	12	3-15
Sexual orgasm/completion	11+12+13	11	3-15

Table 2 – Cut-off scores for females on the CSFQ-14-F (Based on Clayton, 1998, p. 3).

If the male participant has a score that is equal to or below the following cut-off points, it is indicative of sexual dysfunction (Clayton, 1998, p. 3). See table 3 for cut-off scores for males.

Cut-off scores for the CSFQ-M			
Scale	*Questionnaire items*	*Cut-off score*	*Range (min. score and max. score)*
Total CSFQ-14-M score	1-14 (All items added up)	47	14-70
Sexual desire/frequency	2+3	8	2-10
Sexual desire/interest	4+5+6	11	3-15
Sexual pleasure	1	4	1-5
Sexual arousal/erection	7+8+9	13	3-15
Sexual orgasm/ejaculation	11+12+13	13	3-15

Table 3 – Cut-off scores for males on the CSFQ-14-M, (Based on Clayton, 1998, p. 3).

The three phases of sexual functioning are assessed by adding the values of certain items in combination (Keller, McGarvey & Clayton, 2006, pp. 51-52). Desire is calculated by adding up items: 2+3+4+5+6 (Keller, McGarvey & Clayton, 2006, pp. 51-52). Arousal is calculated by adding up items: 7+8+9 (Ibid.). Orgasm/ejaculation is calculated by adding up items: 11+12+13 (Ibid.). The desire phase corresponds to subscale desire/frequency + desire/interest, while the arousal phase corresponds to the subscale arousal/erection and the phase orgasm corresponds to the subscale orgasm/ejaculation. In this way, the phases are assessed with the existing subscales, although desire is divided and assessed both in terms of frequency and interest. For the purpose of this study it made sense to keep the division of the desire scale, which allows to see whether the sexual impairment is particular for the frequency of or the interest in sexual desire.

Statistical analysis

The data is analysed using the Statistical Package for the Social Sciences (SPSS) version 26. The use of MANOVA is advised when testing for differences between two or more populations with two or more dependent variables, when the dependent variables are at interval or ratio level (Coolican, 2014, p. 438). Therefore, the MANOVA was deemed most appropriate as the statistical procedure for comparison of the score results between the genders. The independent variable is gender, with 2 levels – female and male. The dependent variables include the 5 subscale scores: Pleasure, desire/frequency, desire/interest, arousal/erection, orgasm/ejaculation and a total CSFQ-14 score. In figure 5, there is a visual display of the independent variable and the dependent variables for the test results.

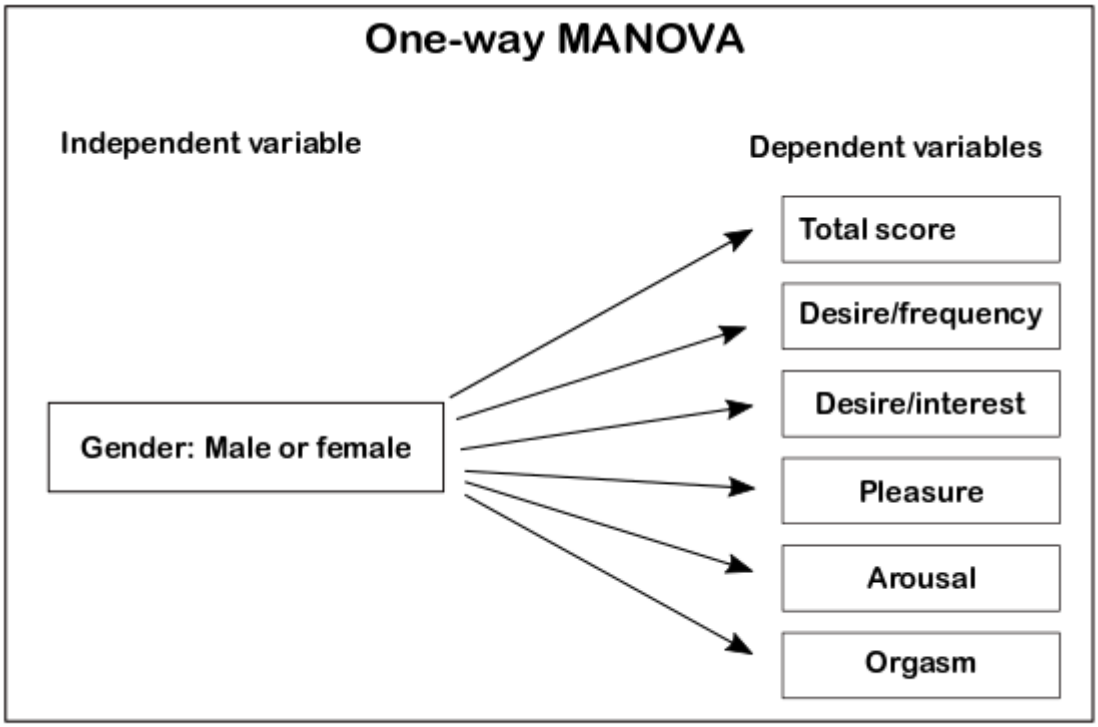

Figure 5 - One-way MANOVA with one independent variable and 6 dependent variables.

Since the cut-off score for males are higher than for females, which makes the test results not directly comparable, it was decided to create a dependent variable that was categorical with two levels: Normal sexual function or sexual dysfunction (both for each of the five subscales and for the

total CSFQ-14 score), see figure 6. Therefore, a 2 x 2 chi-square test of association was used to test if there is a between-gender difference in the prevalence of sexual dysfunction among people with schizophrenia (Coolican, 2014, p. 492). The test is 2 x 2 because there are two rows (female or male) and two columns (normal sexual functioning or sexual dysfunction) (Ibid.). In figure 6, there is a visual display of the independent variable and the dependent variable for the categorical variables.

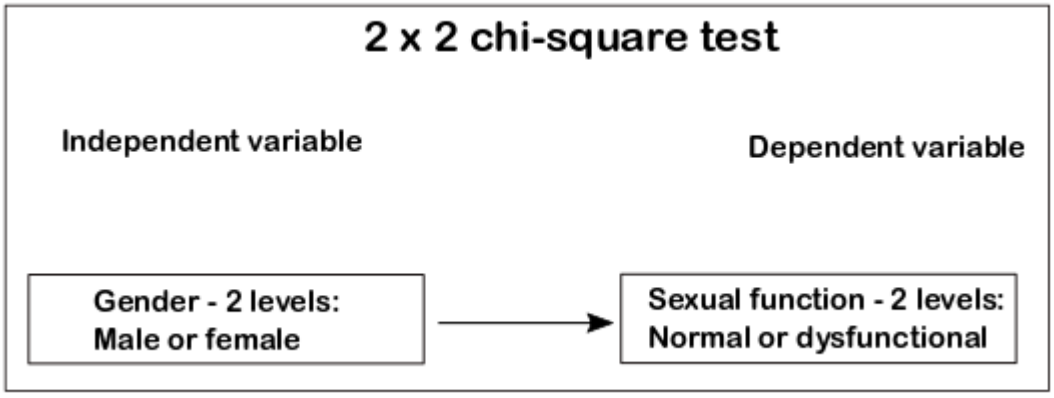

Figure 6 - 2 x 2 chi-square test of association with independent variable and dependent variable.

Results

73 participants visited the online survey. Out of these, 61 participants completed the questionnaire. 12 terminated the questionnaire before completion and were therefore excluded from the analysis of the data, and any obtained data was deleted. Of the 61 participants, there were 48 female participants and 13 male participants. 26 out of 61 (among participants in total, regardless of gender) fulfilled the criteria of current sexual dysfunction according to the CSFQ-14. Hence, the prevalence of sexual dysfunction was 42,6 % among participants. Among the male participants, the prevalence of sexual dysfunction was 61,5 % (8 out of 13). For female participants, the prevalence of sexual dysfunction was 37,5 % (18 out of 48). See the raw scores in Appendix 3.

Test score results and MANOVA

In the following the results of the data analysis will be presented. Because the level of measurement on the dependent variable is interval, the central tendency and dispersion is reported through mean (M) and standard deviation (SD) (Coolican, 2014, p. 367). See table 4 for an overview of the mean scores and standard deviations on the dependent variables (CSFQ-14 test score results) for male and female participants. Data was not too skewed and correlations between the dependent variables did not exceed 0,9 as recommended by Brace, Kemp and Snelgar (2012, p. 311). Assumptions of homogeneity of variance-covariance matrices were confirmed. Assumptions of equality of variance were confirmed for all dependent variables except for the subscale measure of Desire/Interest.

Mean scores and standard deviations for test results						
Gender	Total CSFQ score	Pleasure	Desire/ Frequency	Desire/ Interest	Arousal/ Erection	Orgasm/ Ejaculation
Male (N=13)						
Mean	45,4	2,7	5,9	8,8	9,7	9,2
SD	12,5	1,1	2,4	3,9	3,6	3,4
Female (N=48)						
Mean	44,3	3,2	6,2	8,0	9,5	10,3
SD	9,9	1,3	1,9	2,7	3,2	3,2

Table 4 - Mean scores and standard deviations on subscale measures of the CSFQ for male and female participants

MANOVA and Post-hoc ANOVAs		
Analysis	Dependent variables	Gender
MANOVA	Subscale 1-5 and total CSFQ-14 score	$F(6,54)= 6,5$, $p = 0,000$; Wilks' Lambda = 0,6; Partial $\eta^2 = 0.4$, power = 0,998.
ANOVA	Subscale 1: Pleasure	$F(1,59) = 1,7$, $p = 0,2$, Partial $\eta^2 = 0,03$, power: 0,2.
	Subscale 2: Desire/frequency	$F(1,59) = 0,3$, $p = 0,6$, Partial $\eta^2 = 0,05$, power = 0,08
	Subscale 3: Desire/interest	$F(1,59) = 0,7$, $p = 0,4$, Partial $\eta^2 = 0,01$, power = 0,1.
	Subscale 4: Arousal/erection	$F(1,59)= 0,05$, $p = 0,8$, Partial $\eta^2 = 0,001$, power = 0,06
	Subscale 5: Orgasm/ejaculation	$F(1,59) = 1$, $p = 0,3$, Partial $\eta^2 = 0,02$, power = 0,2.
	Total CSFQ-14 score	$F(1,59) = 0,1$, $p = 0,7$, Partial $\eta^2 = 0,002$, power = 0,06.

Table 5 – Results of the multivariate analysis of test scores.

Based on the MANOVA it is found that there is a statistically significant difference between males and females on the combined dependent variable: Sexual functioning. The effect size is moderate, observed power is high. Analysis of each univariate analysis (ANOVAs) of the dependent variables, using a Bonferroni adjusted alpha level of (0,05/6) 0,008 shows that there is no statistically significant contribution of the various subscales or the total CSFQ-14 score, separately (Coolican, 2014). The fact that the result of the combined dependent variable, sexual functioning, is significant but the individual univariate ANOVAs did not show a significant result, means that it is difficult to determine where the effect originates from (Brace, Kemp & Snelgar, 2012, p. 311).

Frequency of sexual impairments and the chi-square test of association

In figure 7, the percentwise prevalence of sexual impairments among participants according to the six measures, is displayed.

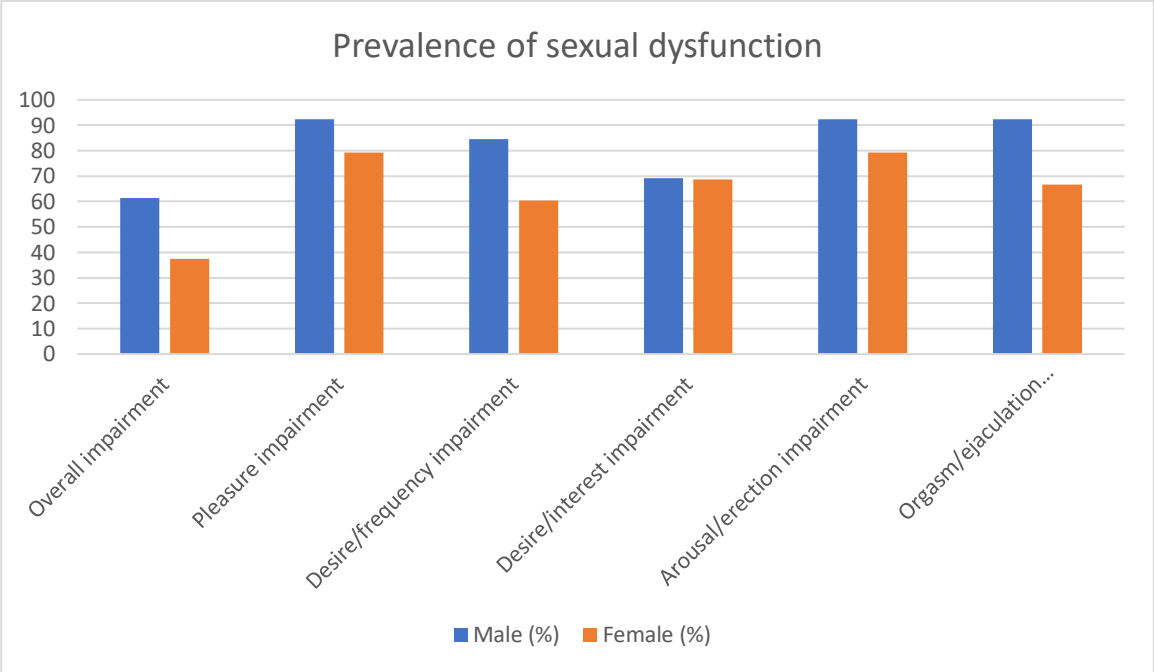

Figure 7 – The prevalence of sexual dysfunction for each of the dependent variables

Although the male participants tend to have higher prevalence of sexual dysfunction as displayed in figure 7, the result of the chi square tests show that there is no significant association between gender and the frequency of sexual dysfunction on the total CSFQ-14 score, or on any of the subscale scores. This suggests that gender does not have an impact on the prevalence of sexual dysfunction among people with schizophrenia. To determine if any of the 6 chi-square tests were statistically significant the p-value is set at (0.05/6) 0,008 in accordance with the Bonferroni correction - see table 6.

Results of the chi-square tests	
Pleasure	χ^2 = 1,2, df = 1, p = 0,3, Φ = 0,14
Desire/Frequency	χ^2 =2,7, df = 1, p = 0,1, Φ = 0,21
Desire/Interest	χ^2 = 0,001, df = 1, p = 0,97, Φ = 0,004
Arousal/Erection	χ^2 = 1,2, df = 1, p = 0,3, Φ = 0,14
Orgasm/Ejaculation	χ^2 = 3,3, df = 1, p = 0,07, Φ = 0,23
Total CSFQ-14 score	χ^2 = 2,4, df = 1, p = 0,1, Φ = 0,19

Table 6

In order to evaluate the result of the chi-square analysis it is important to consider effect size and statistical power. Effect size was found by using the following formula presented in Coolican (2014, p. 497):

$$Cramer's\ \Phi = \sqrt{\frac{X\text{^}2}{(N)df\_smaller}}$$

The calculated effect sizes shown in table 6 are considered 'small' (Ibid.). Using table 18.14 in Coolican (2014) the power of a chi-square analysis can be estimated using the effect size information, degrees of freedom (df) and total sample size (N) (p. 505). Since the calculated effect size was small in all the chi-square analysis, and df = 1 and N = 61, this provides an estimated power between 0,11 and 0,17 which is very low.

Summary

To summarize, the prevalence of sexual dysfunction among people with schizophrenia was found to be 42,6%. The frequency of sexual impairment was higher for males across all domains. The most frequent sexual impairment was pleasure, arousal and orgasm among males with an equal distribution. For females pleasure and arousal were the most frequent impairments. A MANOVA was carried out to test for between-gender differences in the test results on the CSFQ-14. The results show that when dependent variables are combined there is a gender difference but each of

the univariate analysis are non-significant which suggests that there is no gender difference in test results on the dependent variables separately. In order to test if gender influences the prevalence of sexual dysfunctions in people with schizophrenia a chi-square test of association was conducted on the number of sexual impairments for males and females across the domains: Pleasure, desire/frequency, desire/interest, arousal, orgasm and overall impairment (according to the CSFQ-14 criteria). The chi-square analysis for each of the scales suggests that there is not an association between gender and the prevalence of sexual dysfunction in people with schizophrenia.

Discussion

Hypothesis 1 – the prevalence of sexual dysfunction among people with schizophrenia

In this study the overall prevalence of sexual dysfunction was found to be 42,6 %. This is consistent with hypothesis 1 based on previous findings, where the prevalence has been estimated to be 30-80 % (Baggaley, 2008, p. 201). There was a high prevalence of sexual dysfunction across all domains of the CSFQ-14 (Pleasure, desire/frequency, desire/interest, arousal/erection and orgasm/ejaculation and total CSFQ-14 score). So, what causes this high prevalence of sexual dysfunction among people with schizophrenia? According to Wolf (2006), anhedonia, or: "A *reduced capacity to experience pleasure (…)"* is very common in people with schizoprhenia (p. 322). Although he further states that it is not a universal trait (Wolf, 2006, p. 326). Moreover, anhedonia, in addition to other deficit symptoms, have been found to play an important role for the long-term outcome in people with schizophrenia (Ibid., p. 322). Wolf (2006) further suggests that anhedonia is mediated through mesolimbic hypofunction (Ibid., p. 325). This is based on studies, where reduced activity in the mesolimbic system was found to correlate with negative symptoms (Taylor et al., 2005; Juckel et al., 2006 as cited in Wolf, 2006, p. 325).

There is however the confounding factor of side effects from antipsychotic medications. The prolactin level increasing and dopamine antagonistic properties of antipsychotic medications and perhaps comorbidity factors, are also important factors in causing sexual dysfunction in people with schizophrenia and were not accounted for in this study (Cutler, 2003, p. 69). However, recent findings by Dembler-Stamm et al. (2018), as referred to in the literature review, suggest that schizophrenia has an impact on the prevalence of sexual dysfunction which is independent of the effects of antipsychotic medication.

Considering anhedonia and an increased tendency to social withdrawal in people with schizophrenia from an evolutionary perspective, it makes sense that diseased individuals don't seek out reproductive activities, as individual survival and the avoidance of pain/danger comes before reproduction and pleasure seeking, which has also been argued by Kaplan (1979, p. 12). Although this is perhaps an adaptive behaviour from an evolutionary perspective, it is counterintuitive today when sex and reproduction are no longer dependent on each other and knowing how beneficial a healthy sex life is to physiological and psychological health and quality of life (Olfson et al. 2005, p. 337). As sexual dysfunction is highly prevalent in the schizophrenic population, mental health professionals should therefore address the issue of sexual dysfunction in order to enhance treatment compliance (Fan et al., 2007, p. 126).

Hypothesis 2 - frequency of sexual dysfunction between the genders

The prevalence of overall sexual dysfunction was found to be 61,5% for males and 37,5% for females. In general, the prevalence of sexual impairment across all domains is higher for male participants. This is in accordance with the hypothesis 2 expectation, that the prevalence of sexual dysfunction is higher for males. The findings in this study must be generalized with caution as female participants were overrepresented in the sample. Moreover, the cut-off scores were based on normative data that was gathered elsewhere, which ultimately can result in both type 1 and type 2 errors. Therefore, it is important to consider more local data-collection for a better frame of reference in the future.

Hypothesis 3 - the most frequent sexual impairment

It was hypothesized that the most frequent sexual impairment for males would be in orgasm and arousal. The most frequent dysfunction for females was hypothesized to be impairment in desire and orgasm. The findings of this study show that the most frequent sexual impairments are found in the domains: Pleasure, arousal and orgasm for males, with an equal distribution. For females the most frequent sexual impairments are found in the domains: Pleasure and arousal. The findings agree with the expectations for males, while the findings did not support what was expected to be the most frequent impairments in females. Although the CSFQ-14 is a reliable and valid measure of sexual impairments, it is a point of criticism that the pleasure domain consists of only one item. The item assesses current pleasure with sex life compared to previously experienced pleasure with sex

life. It could be argued that this is too narrow of an indicator of experienced pleasure and is perhaps too sensitive and unspecific. Perhaps it would make more sense to include more items that assess pleasure associated with each of the three phases of the sexual response cycle, as well as overall experienced pleasure.

Hypothesis 4 - between-gender difference in sexual dysfunction

The 4th hypothesis that the prevalence of sexual dysfunction would be significantly higher for males than females was not supported by the chi-square test. There was not found a significant between-gender difference in the prevalence of sexual dysfunction on any of the six domains of the CSFQ-14. Either the null hypothesis is true and there is no difference or association between gender and sexual dysfunctions. Alternatively, it could be a case of a type II error, where a difference or association exists, but the design of the study failed to detect it because of insufficient statistical power. On the chi-square analysis, a small effect size (0,19) and an estimated power of 0,11 was found, which is very low. One way to overcome this is to increase sample size in future studies.

A discussion of the employed method

For the purpose of this study, the online survey method was found useful as it is free of interviewer bias, and likely leads to less embarrassment given the sensitive topic. This may allow participants to respond more freely and honestly. One weakness of this method is that participants were recruited through forums on social media and participation in surveys generally tend to attract a specific group of people, which leaves the question of representativeness of the sample. Moreover, using this format does not allow a verification of whether the subjects who participated do in fact have a diagnosis of schizophrenia. Neither does it verify what symptoms participants are experiencing. One way to overcome this in future studies, is to include a measure of the symptoms experienced by the participants, for example by using the PANSS (Positive and Negative Syndrome Scale) which is a scale that is specifically designed to measure symptom severity in patients with schizophrenia (Dragioti et al., 2016, p. 66). Another way of overcoming this obstacle is to simply administer the questionnaire in person, with patients who are known to have a diagnosis of schizophrenia and simultaneously record their experienced symptoms. Although, as the topic is very sensitive, this might affect the participants into understating the true extent of their experiences of sexual dysfunctions and it is not even certain that patients are willing to openly discuss these

matters with researchers. Therefore, it is argued that the advantages of this more anonymous method of the present study generally outweigh the disadvantages.

The use of a standardized measure like the CSFQ-14 which has relevant and non-intrusive items and had a clear and easy scoring manual and where the three phases of the sexual response are assessed proved very useful. Further studies are however needed to validate the Danish translation of the CSFQ-14 employed in this study. Due to the different cut-off scores for males and females, the test results were not directly comparable. The cut-off scores were based on comparisons of non-depressed participants and clinically depressed patients (Clayton, 1998, p. 3). For that reason, the variables were converted to categorical variables that do not provide information about the distance between values. Therefore, it made sense to include descriptive and inferential statistics on both the dependent variables of the test score results and for the frequency of sexual dysfunctions in the 5 subscales and the total CSFQ-14 score. The reason why the 14-item version was chosen, is because it is short and perhaps better suited for an online survey, and may be more acceptable to participants than a lengthy questionnaire. However, it needs to be considered if there are more appropriate measures of sexual functioning than the CSFQ-14. For instance the full version (CSFQ). The longer original version might be more suitable and comprehensive as there are more items per subscale.

A different point of criticism is that the CSFQ-14 purportedly assesses *changes* in sexual functioning. However, only one item actually compares past experience with present experience, which is item 1 that assesses pleasure. Regarding item 2, which asks the subject about the frequency of sexual activity, sexual intercourse and auto-erotic activity are both included instead of separately. This poses a potential problem, since the two domains are very different in nature and frequency of auto-erotic activity does not necessary equals the same frequency of sexual intercourse.

A discussion of the employed theory

The operationalisation of sexual dysfunction in this study was based on Kaplan's tri-phasic theory (desire, excitement and orgasm) of the sexual response cycle. The strength of this framework is that it can be applied to both males and females. It is also specific and simple, relevant and broadens the definition of what a sexual dysfunction signifies. This enables an understanding of sexual dysfunction as multifaceted, as it can happen in any of the three phases or in multiple or all of the

phases. A division of the sexual response cycle also enables an exploration of the most frequent sexual impairments. One shortcoming of using this framework is that it does not include the assessment of a person's experienced emotional intimacy, which was advocated by Basson, in her model of the sexual response cycle in 2000 (Levin, 2017, p. 43). Instead, Kaplan's theory is primarily based on the physiological mechanisms that underlie the three phases of the sexual response cycle. While it made sense to use Kaplan's theoretical framework for this study, it is primarily a biologic perspective where social and cognitive aspects are vastly neglected. During the review of the different theories of sexuality, sexual script theory by sociologists Simon & Gagnon (1984) was encountered. Perhaps a different way of measuring sexual functioning by using the theoretical framework of sexual script theory could lend new and interesting insights. Simon & Gagnon's sexual script theory could enlighten the subject of interest with a social psychological and/or cognitive psychological perspective. And perhaps it could help clarify if (and perhaps how) gender affects sexual functioning in people with schizophrenia.

Implications of research findings

The main objective behind conducting this research was to produce updated knowledge regarding the prevalence of sexual dysfunctions in people with schizophrenia and find out whether there is a gender bias. The findings of this study have contributed to the existing knowledge in the field and suggests that the prevalence of sexual dysfunctions is high for people with schizophrenia and that there is no between-gender difference. Ultimately this will hopefully raise awareness in mental health professionals to address concerns regarding sexual problems and intimacy issues, enhance treatment compliance, create better interventions and treatment outcome in the future. Kelly & Conley (2004) as well as Olfson et al. (2005) have made some excellent suggestions for initiatives that have the potential to improve sexual functioning in people with schizophrenia. These include: Counselling, switching to other medications, reducing medication dosage, and use of medical therapy (Olfson et al., 2015, p. 337). Additionally, Lukoff et al. (1986) created an education program, with the aim of providing information, overcoming sexual dysfunction and enhancing intimacy skills (p. 669. This program also poses as an initiative with great potential, perhaps particularly in out-patients who are free of positive symptoms but still suffers from effects of negative symptoms such as anhedonia and side effects from antipsychotic medications. Regardless, Like McCann (2000) states it, it is imperative that sexual matters are addressed as well as other

important matters, when mental health professionals claim to be, and aim at taking a holistic biopsychosocial approach in the treatment of people with schizophrenia (McCann, 2000, p. 136).

Summary

To summarize, it is arguably a combination of the negative symptoms from schizophrenia and side effects from antipsychotic medication that cause the high prevalence of sexual dysfunction in people with schizophrenia. This makes sense from an evolutionary perspective, where survival of the individual and avoidance of pain or danger comes before pleasure-seeking and reproductive activities (Kaplan, 1979, p. 12). That there is no difference between genders in the prevalence of sexual dysfunctions is in line with some of the previous findings. However, it is important to bear the limitations of this study in mind. For instance females were overrepresented in the sample and there is lack of sufficient statistical power to eliminate the possibility of a type II error. Even so, this study is a step on the way to clarify if gender exerts an influence on the prevalence of sexual dysfunctions among people with schizophrenia. Furthermore, it might help raising awareness of a somewhat neglected issue, where enhancing acknowledgement has the potential to lead to better interventions and treatment outcome for patients with schizophrenia in the future.

Conclusion

The objective of this study was to find the prevalence of sexual dysfunction and to clarify whether gender exerts an influence on sexual functioning in people with schizophrenia. Reviewing existing literature revealed that, for the time being, results are conflicting and somewhat insufficient to determine the prevalence and if there is a gender bias in sexual dysfunctions among people with schizophrenia. The approach taken in this paper, involved the use of the theoretical framework formulated by Kaplan in her tri-phasic theory of the sexual response cycle. Kaplan's tri-phasic theory gives an understanding of the human sexual response cycle as consisting of a first phase of desire, then a second phase of excitement and finally a third phase of orgasm. The use of this theoretical framework has provided an understanding of the CSFQ-14 measure as a measure of the three phases of the male and female sexual response cycle. By employing a cross sectional group difference design, 61 participants partook in an online questionnaire with a translated version of the

items of the CSFQ-14-M and CSFQ-14-F. Exploring the results revealed an overall prevalence of sexual dysfunctions of 42,6 % among the participants with schizophrenia.

The prevalence of overall impairment is higher for male participants and the most frequent sexual dysfunctions are in the domains of pleasure, arousal and orgasm for males. Resulting scores on the CSFQ-14 measure of sexual functioning were analysed with a multivariate analysis of variance (MANOVA), with gender as the independent variable, and the CSFQ-14 total and subscale scores as the dependent variables. The CSFQ-14 subscale scores measures the domains: Pleasure, desire/frequency, desire/interest, arousal/erection, orgasm/ejaculation. The result of the MANOVA shows that gender does not affect any of the 6 dependent variables separately. Because cut-off scores are different for males and females on the CSFQ-14, new dependent variables were created for each of the 6 measurement scores. Here the scores for each participant were categorized as either “normal sexual functioning” or “sexual dysfunction”. These dependent categorical variables were analysed with a chi-square test of association. The chi-square test of association shows that no statistically significant difference between groups (male/female) was found in this data set, on either of the dependent variables (neither on each of the subtests or the total score on the CSFQ-14). The lack of effect in the chi square test of association could be caused by a small sample bias, as observed power was found to be very low. Therefore, caution must be taken in generalizing these results, and the conclusions need to be further explored using a larger sample size in the future. Although the present study alone is insufficient to clarify if (and maybe) how gender influences sexual functioning in people with schizophrenia, the results of this study contributes to an evolving line of research that aims to demonstrate whether such an effect truly exists. In conclusion, a high prevalence of sexual dysfunctions was found among people with schizophrenia. Hopefully this will raise awareness in mental health professionals about the high prevalence of sexual dysfunctions in people with schizophrenia, so better therapeutic interventions can be provided in order to increase treatment compliance and quality of life for this population group. In addition, results of this study indicate that there is no between-gender difference in the prevalence of sexual dysfunction or in prevalence of impairment in any of the sexual response phases, in people with schizophrenia. Hopefully this will make mental health professionals routinely ask out- and inpatients about sexual health issues.

Further perspectives

Assessing sexual functioning in people with schizophrenia can be challenging. In this paragraph suggestions are given for future research and methodological issues that needs to be considered.

1) During this project, it became clear that medical complications such as the metabolic syndrome should have been considered when making the survey. According to Fan et al. (2007) the metabolic syndrome (obesity, hypertension, or diabetes) is known to be associated with sexual dysfunction in both men and women (Fonseca and Jawa, 2005, Seftel, 2005 as cited in Fan et al., 2007, p. 126). Therefore, it might prove worthwhile to explore how the metabolic syndrome affects sexual functioning in the people with schizophrenia, as obesity is a common side effect from antipsychotic medications.

2) Age and educational level were not accounted for in this study. However, during this project it became clear that there is evidence to suggest that both age and education affects sexual functioning. Age has been found to influence the sexual response cycle in a negative way, as the prevalence of sexual dysfunctions increases with age (Camacho & Reyes-Ortiz, 2005, p. 52). Regarding educational level, Fortier et al. (2003) state that it has been demonstrated by Laumann et al. in 1994 that educational level is related to certain aspects of sexual functioning (Fortier et al., 2003, p. 570). Accordingly, they found that the more women are educated, the less they suffer from sexual dysfunctions such as orgasmic dysfunctions and lack of sexual desire (Laumann et al., 1994 as cited in Fortier et al., 2003, p. 570). Although it could be interesting to include more demographic factors in a study, there is however a certain ethical aspect that needs consideration, as including too many demographic factors has the potential to compromise participants' anonymity and privacy rights. This is especially the case when using social forums on social media where a list of members is easily obtained. Therefore, the collection of rich demographic data should be done with care.

3) It was not part of the present investigation whether the subjects were in- or out-patients. Whether the subjects are hospitalized or not, might influence their overall functional level and sexual functioning in different ways. For instance it has been suggested by de Boer et al. (2015) that hypersexuality can occur during an acute psychotic phase (p. 675). In a future study it should be explored whether it makes a difference if subjects are hospitalized or not, and what phase of the disorder they are in and how it affects their sexual functioning.

4) Comorbidity was also not accounted for in this study. Perhaps a comorbid diagnosis of depression, which is known to also affect sexual functioning, might exacerbate a person's score on the CSFQ-14 in a negative direction. According to Wolf (2006), depression is common in people with schizophrenia (p. 324).

5) One final consideration concerns gender as a concept, as it has seen recent development. For the purpose of this study it made sense to create two categories based on existing knowledge about the female and male sexual response cycles. However, instead of regarding gender as consisting of two mutually exclusive categories a third non-binary category could be included, as there is a small percentage of the general population who identify themselves as having a non-binary gender. Perhaps in future studies, research with a more inclusive approach will be seen.

To summarize, future research should consider the metabolic syndrome, age, educational level, hospitalization and the different phases of schizophrenia when exploring the prevalence of sexual dysfunctions in people with schizophrenia and if there is a gender bias in the prevalence of sexual dysfunctions. While it can prove to be methodologically complex to examine sexual functioning in people with schizophrenia, it can be argued that it is worth doing so when it has the potential to enhance acknowledgement of the issue and improve treatment outcome and quality of life in this population group.

References

Acuña, M. J., Martín, J. C., Graciani, M., Cruces, A. & Gotor, F. (2010). A comparative study of the sexual function of institutionalized patients with schizophrenia. *The Journal of Sexual Medicine*, 7, 3414-3423, DOI: 10.1111/j.1743-6109.2010.01832.x

Baggaley, M. (2008). Sexual dysfunction in schizophrenia: Focus on recent evidence. *Hum. Psychopharmacol. Clin Exp*, 23, 201-209. DOI: 10.1002/hup.924

Barnett, R. (2018) Case histories: Schizophrenia. *The Lancet*, 391, 648.

Bengtsson-Tops, A. & Hansson, L. (1999). Clinical and social needs of schizophrenic outpatients living in the community: The relationship between needs and subjective quality of life. *Soc psychiatry psychiatry epidemiol*, 34, 513-518.

Bhui, K., Puffet, A. & Herriot, P. (1995). A survey of sexual problems amongst psychiatric

patients. *Soc Psychiatry Psychiatr Epidemiol,* 30, 73-77.

Brace, N., Kemp, R. and Snelgar, R. (2012). *SPSS for psychologists* (5th edition). Palgrave Macmillan.

Bram, N., Rafrafi, R., Abdelghaffar, W., Lakhal, M. H., Ouanes, S., & El Hechmi, Z. (2014). Sexual dysfunctions in Tunisian patients with schizophrenia. *Sexologies,* 23, 66-70, http://dx.doi.org/10. 1016/j.sexol.2014.05.004

Calabrò, R. S., Cacciola, A., Bruschetta, D., Milardi, D., Quattrini, F., Sciarrone, F., la Rosa, G., Bamanti, P. & Anastasi, G. (2019). Neuroanatomy and function of human sexual behavior: A neglected or unknown issue? *Brain and behavior,* 1-17, DOI: 10.1002/brb3.1389

Camacho, M. & Reyes-Ortiz, C. (2005). Sexual dysfunction in the elderly: Age or disease? *International Journal of Impotence Research*, 17, 52-56.

Clayton, A. (1998). Changes in sexual functioning questionnaire (CSFQ-F-C & CSFQ-M-C). *Dept. of psychiatric medicine, University of Virginia Health System*, 1-3.

Colman, A. M. (2009). *Oxford dictionary of psychology*. Oxford University Press.

Coolican, H. (2014). *Research methods and statistics in psychology (*6th edition). Psychology Press.

Cutler, A. J. (2003). Sexual dysfunction and anti-psychotic treatment. *Psychoneuroendocrinology*, 28, 69-82. DOI:10.1016/S0306-4530(02)00113-0

de Boer, M. K., Castelein, S., Wiersma, D., Schoevers, R. A. & Knegtering, H. (2015). The facts about sexual (dys)function in schizophrenia: An overview of clinically relevant findings. *Schizophrenia Bulletin,* 41:3, 674-686. DOI:10.1093/schbul/sbv001

Dembler-Stamm, T., Fiebig, J., Heinz, A. & Gallinat, J. (2018). Sexual dysfunction in unmedicated patients with schizophrenia and in healthy controls. *Pharmacopsychiatry,* 51:06, 1-11, DOI: 10.1055/s-0044-100627

Dossenbach, M., Hodge, A., Anders, M., Molnár, B., Peciukaitiene, D., Krupka-Matuszczyk, I., Tatu, M., Bondar, V., Pecenak, J., Gorjanc, T. & McBride, M. (2005). Prevalence of sexual dysfunction in patients with schizophrenia: International variation and underestimation. *International journal of neuropsychopharmacology*, 8, 195-201, DOI:10.1017/S1461145704005012

Dragioti, E., Wiklund, T., Siamouli, M., Moutou, K. & Fountoulakis, K. N. (2017). Could PANSS be a useful tool in the determining of the stages of Schizophrenia? A clinically operational approach. *Journal of Psychiatric Research*, 86, 66-72, http://dx.doi.org/10.1016/j.jpsychires.2016.11.013

Fan, X., Henderson, D. C., Chiang, E., Namey Biggs, L. B., Freudenreich, O., Eden Evins, A.,

Cather, C. & Goff, D. C. (2007). Sexual functioning, psychopathology and quality of life in patients with schizophrenia. *Schizophrenia research*, 94, 119-127.

Fortier, P., Mottard, J. P., Trudel, G. & Even, S. (2003). Study of sexuality-related characteristics in young adults with schizophrenia treated with novel neuroleptics and in a comparison group of young adults. *Schizophrenia Bulletin*, 29:3, 559-572.

Giles, K. R. & McCabe, M. P. (2009). Conceptualizing women's sexual function: Linear vs. circular models of sexual response. *J Sex Med*, 6, 2761-2771, DOI: 10.1111/j.1743-6109.2009.01425.x

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. J Sex Med, 12, 116-128, DOI: 10.1111/jsm.12720

Harley, E. W., Boardman, J. & Craig, T. (2010). Sexual problems in schizophrenia: Prevalence and characteristics – a cross sectional survey. *Soc psychiat epidemiol*, 45, 759-766.

Jager, J. & McCann, E. (2017). Psychosis as a barrier to the expression of sexuality and intimacy: An environmental risk? *Schizophrenia Bulletin*, 43:2, 236-239. DOI:10.1093/schbul/sbw172

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

Keller, A., McGarvey, E. L. & Clayton, A. H. (2006). Reliability and Construct Validity of the Changes in Sexual Functioning Questionnaire Short-Form (CSFQ-14), *Journal of Sex & Marital Therapy*, 32:1, 43-52, DOI: 10.1080/00926230500232909

Kelly, D. L., & Conley, R. R. (2004). Sexuality and schizophrenia: A review. *Schizophrenia Bulletin*, 30:4. 767-779.

Levin, R. J. (2017). The human sexual response cycle. In W. W. IsHak (Ed.), *The textbook of clinical sexual medicine* (pp. 39-51). Springer International Publishing. DOI 10.1007/978-3-319-52539-6

Liu-Seifert, H., Kinon, B. J., Tennant, C. J., Sniadecki, J. & Volavka, J. (2009). Sexual dysfunction in patients with schizophrenia treated with conventional antipsychotics or risperidone. *Neuropsychiatric disease and treatment*, 5, 47-54.

Lukoff, D., Gioia-Hasick, D., Sullivan, G., Golden, J. S. & Nuechterlein, K. H. (1986). Sex education and rehabilitation with schizophrenic male outpatients. *Schizophrenia Bulletin*, 12:4, 669-677.

Lyketsos, G. C., Sakka, P. & Maïlis, A. (1983). The sexual adjustment of chronic schizophrenics: A preliminary study. *Brit. J. Psychiat*, 143, 376-382.

Macdonald, S., Halliday, J., MacEwan, T., Sharkey, V., Farrington, S., Wall, S. & McCreadie, R.

G. (2003). Nithsdale schizophrenia surveys 24: Sexual dysfunction. *British journal of psychiatry*, 182, 50-56.

Marques, T. R., Smith, S., Bonaccorso, S., Gaughran, F., Kolliakou, A., Dazzan, P., Mondelli, V., Taylor, H., DiForti, M., McGuire, P. K., Murray, R. M. & Howes, O. D. (2012). Sexual dysfunction in people with prodromal or first-episode psychosis. *The British Journal of Psychiatry*, 201, 131-136, DOI: 10.1192/bjp.bp.111.101220

McCann, E. (2000). The expression of sexuality in people with psychosis: Breaking the taboos. *Journal of Advanced Nursing*, 32:1, 132-138.

Moukas, G., Gourzis, P., Beratis, I. N. & Beratis, S. (2010). Sex differences in prepsychotic "prodromal" symptomatology and its association with positive and negative syndrome scale active phase psychopathology in male and female patients. *Comprehensive Psychiatry*, 51, 546-551. doi:10.1016/j.comppsych.2009.11.003

Nakhli, J., Sehli, J., Bouhlel, S., El kissi, Y., Ben Nasr, S. & Ben Hadj Ali, B. (2016). Sexuality of patients with schizophrenia: Gender differences. *Psychiatric department Farhat Hached University Hospital*, Sousse, Tunisia (Poster), 1.

Olfson, M., Uttaro, T., Carson, W. H. & Tafesse, E. (2005). Male sexual function and quality of life in schizophrenia. *J Clin Psychiatry*, 66, 331-338.

Os, J. V., Kenis, G. & Rutten, B. P. F. (2010). The environment and schizophrenia. *Nature*, 468, 203–212. DOI:10.1038/nature09563.

Östman, M. & Björkman, A. C. (2013). Schizophrenia and relationships: The effect of mental illness on sexuality. *Clinical schizophrenia and related psychoses*, 20-24.

Perkins, D. O. (2002). Predictors of non-compliance in patients with schizophrenia. *J Clin Psychiatry*, 63:12, 1121-1128.

Shean, G. D. (2004) *Understanding and treating schizophrenia: Contemporary research, theory and practice.* The Haworth Clinical Practice Press.

Snell, W. E., Fisher, T. D. & Walters, A. S. (1993). The multidimensional sexuality questionnaire: An objective self-report measure of psychological tendencies associated with human sexuality. Annals of sex research, 6, 27-55.

Simon, W. & Gagnon, J. H. (1984). Sexual scripts. *Society*, 53-60.

Tharoor, H., Kaliappan, A. & Gopal, S. (2015). Sexual dysfunctions in schizophrenia: Professionals and patients perspectives. *Indian journal of psychiatry*, 57:1, 85-87.

Wasow, M. (1980). Sexuality and the institutionalised mentally ill. *Sexuality and disability*, 3:1, 3-16.

WHO ICD-10 (2016). Chapter V Mental and behavioural disorders, section F20-F29 Schizophrenia, schizotypal and delusional disorders. Accessed 24.10.2019 from: https://icd.who.int/browse10/2016/en#/F20-F29

WHO ICD-10 (2018). *Psykiske lidelser og adfærdsmæssige forstyrrelser – klassifikation og diagnostiske kriterier*. Munksgaard.

Wolf, D. H. (2006). Anhedonia in Schizophrenia. *Current Psychiatry Reports*, 8, 322-328.

New course material

Acuña, M. J., Martín, J. C., Graciani, M., Cruces, A. & Gotor, F. (2010). A comparative study of the sexual function of institutionalized patients with schizophrenia. *The Journal of Sexual Medicine*, 7, 3414-3423, DOI: 10.1111/j.1743-6109.2010.01832.x [10 pages].

Atwood, J. D., & Klucinec, E. (2007). Current state of sexuality theory and therapy. *Journal of Couple & Relationship Therapy, 6:1-2*, pp. 57-70, DOI: 10.1300/ J398v06n01_06 [14 pages].

Baggaley, M. (2008). Sexual dysfunction in schizophrenia: Focus on recent evidence. *Hum. Psychopharmacol. Clin Exp*, 23, 201-209. DOI: 10.1002/hup.924 [9 pages].

Barnett, R. (2018) Case histories: Schizophrenia. *The Lancet*, 391, 648. [1 page].

Basson, R. (2000). The female sexual response: A different model. Journal of Sex & Marital Therapy, 26, 51–65. [15 pages].

Bengtsson-Tops, A. & Hansson, L. (1999). Clinical and social needs of schizophrenic outpatients living in the community: The relationship between needs and subjective quality of life. *Soc psychiatry psychiatry epidemiol*, 34, 513-518. [6 pages].

Bhui, K., Puffet, A. & Herriot, P. (1995). A survey of sexual problems amongst psychiatric patients. *Soc Psychiatry Psychiatr Epidemiol*, 30, 73-77. [5 pages].

Bobes, J., García-Portilla, M. P., Rejas, J., Hernández, G., Garcia-Garcia, M., Rico-Villademoros, F. & Porras, A. (2003). Frequency of Sexual Dysfunction and Other Reproductive Side-effects in Patients with Schizophrenia Treated with Risperidone, Olanzapine, Quetiapine, or Haloperidol: The Results of the EIRE Study. Journal of sex and marital therapy, 29:2, 125-147. DOI: 10.1080/00926230390155023 [23 pages].

Bram, N., Rafrafi, R., Abdelghaffar, W., Lakhal, M. H., Ouanes, S., & El Hechmi, Z. (2014). Sexual dysfunctions in Tunisian patients with schizophrenia. *Sexologies*, 23, 66-70, http://dx.doi.org/10. 1016/j.sexol.2014.05.004 [5 pages].

Calabrò, R. S., Cacciola, A., Bruschetta, D., Milardi, D., Quattrini, F., Sciarrone, F., la Rosa, G.,

Bamanti, P. & Anastasi, G. (2019). Neuroanatomy and function of human sexual behavior: A neglected or unknown issue? *Brain and behavior*, 1-17, DOI: 10.1002/brb3.1389 [17 pages].

Camacho, M. & Reyes-Ortiz, C. (2005). Sexual dysfunction in the elderly: Age or disease? *International Journal of Impotence Research*, 17, 52-56. [5 pages].

Clayton, A. (1998). Changes in sexual functioning questionnaire (CSFQ-F-C & CSFQ-M-C). *Dept. of psychiatric medicine, University of Virginia Health System*, 1-3. [3 pages].

Colman, A. M. (2009). *Oxford dictionary of psychology*. Oxford University Press. [1 page].

Cutler, A. J. (2003). Sexual dysfunction and anti-psychotic treatment. *Psychoneuroendocrinology*, 28, 69-82. DOI:10.1016/S0306-4530(02)00113-0 [14 pages]

de Boer, M. K., Castelein, S., Wiersma, D., Schoevers, R. A. & Knegtering, H. (2015). The facts about sexual (dys)function in schizophrenia: An overview of clinically relevant findings. *Schizophrenia Bulletin*, 41:3, 674-686. DOI:10.1093/schbul/sbv001 [13 pages].

Dembler-Stamm, T., Fiebig, J., Heinz, A. & Gallinat, J. (2018). Sexual dysfunction in unmedicated patients with schizophrenia and in healthy controls. *Pharmacopsychiatry*, 51:06, 1-11, DOI: 10.1055/s-0044-100627 [11 pages].

Dossenbach, M., Hodge, A., Anders, M., Molnár, B., Peciukaitiene, D., Krupka-Matuszczyk, I., Tatu, M., Bondar, V., Pecenak, J., Gorjanc, T. & McBride, M. (2005). Prevalence of sexual dysfunction in patients with schizophrenia: International variation and underestimation. *International journal of neuropsychopharmacology*, 8, 195-201, DOI:10.1017/S1461145704005012 [7 pages].

Dragioti, E., Wiklund, T., Siamouli, M., Moutou, K. & Fountoulakis, K. N. (2017). Could PANSS be a useful tool in the determining of the stages of Schizophrenia? A clinically operational approach. *Journal of Psychiatric Research*, 86, 66-72, http://dx.doi.org/10.1016/j.jpsychires.2016.11.013 [7 pages].

Eklund, M. & Östman, M. (2010). Belonging and doing: Important factors for satisfaction with sexual relations as perceived by people with persistent mental illness. *International Journal of Social Psychiatry*, 56:4, 336-347. DOI: 10.1177/0020764008101635. [12 pages].

Fan, X., Henderson, D. C., Chiang, E., Namey Biggs, L. B., Freudenreich, O., Eden Evins, A., Cather, C. & Goff, D. C. (2007). Sexual functioning, psychopathology and quality of life in patients with schizophrenia. *Schizophrenia research*, 94, 119-127. [9 pages].

Fortier, P., Mottard, J. P., Trudel, G. & Even, S. (2003). Study of sexuality-related characteristics in young adults with schizophrenia treated with novel neuroleptics and in a comparison group of young adults. *Schizophrenia Bulletin*, 29:3, 559-572. [14 pages].

Fried, A. L. (2012). Ethics in psychological research: Guidelines and regulations. In H. Cooper, P.

M. Camic, D. L. Long, A. T. Panter, D. Rindskopf & K. J. Sher (Eds.), *APA Handbook of Research Methods in Psychology* (1. Ed., Vol. 1. pp. 55-73). Washington, DC, American Psychological Association. DOI: 10.1037/13619-000. [19 pages].

Giles, K. R. & McCabe, M. P. (2009). Conceptualizing women's sexual function: Linear vs. circular models of sexual response. *J Sex Med*, 6, 2761-2771, DOI: 10.1111/j.1743-6109.2009.01425.x [11 pages].

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. J Sex Med, 12, 116-128, DOI: 10.1111/jsm.12720 [13 pages].

Goldstein, W. N. (1978). Toward an integrated theory of schizophrenia. Schizophrenia Bulletin, Vol. 4, No. 8, pp. 426-435. [10 pages].

Greenberg, J. M., Smith K. P., Kim, T. Y., Naghdechi, L. & IsHak, W. W. (2017). Sex and quality of life. In W. W. IsHak (Ed.), *The textbook of clinical sexual medicine* (539-572) Springer International Publishing. DOI 10.1007/978-3-319-52539-6. [34 pages].

Häfner, H. (2003). Gender differences in schizophrenia. Psychoneuroedocrinology, 28, 17-54. doi:10.1016/S0306-4530(02)00125-7 [38 pages].

Harley, E., Boardman, J. & Craig., T. (2010). Sexual problems in schizophrenia: Prevalence and characteristics. A cross-sectional survey. *Soc Psychiat Epidemiol*, 45, 759–766. DOI 10.1007/s00127-009-0119-0. [8 pages].

Herbener, E. S. & Harrow, M. (2002). The Course of Anhedonia During 10 Years of Schizophrenic Illness. *Journal of Abnormal Psychology*, 111:2, 237-248. DOI: 10.1037//0021-843X.111.2.237 [12 pages].

Jager, J. & McCann, E. (2017). Psychosis as a barrier to the expression of sexuality and intimacy: An environmental risk? *Schizophrenia Bulletin*, vol. 43, no. 2. 236-239. DOI:10.1093/schbul/sbw172 [4 pages].

Kaplan, H. S. (1979). *Disorders of sexual desire*. Vol. II. New York, Brunner/Mazel, 3-23 [21 pages].

Keller, A., McGarvey, E. L. & Clayton, A. H. (2006). Reliability and Construct Validity of the Changes in Sexual Functioning Questionnaire Short-Form (CSFQ-14), *Journal of Sex & Marital Therapy*, 32:1, 43-52, DOI: 10.1080/00926230500232909 [10 pages].

Kelly, D. L., & Conley, R. R. (2004). Sexuality and schizophrenia: A review. *Schizophrenia Bulletin*, 30:4. 767-779. [13 pages].

Kikuchi, T., Iwamoto, K., Sasada, K., Aleksic, B., Yoshida, K & Ozaki, N. (2012). Sexual dysfunction and hyperprolactinemia in Japanese schizophrenic patients taking antipsychotics. *Progress in neuro-psychopharmacology & biological psychiatry*, 37, 26-32. [7 pages].

Klimowicz, A., Janicic, A. & IsHak, W. W. (2017). Sex and chronic psychiatric illness. In W. W. IsHak (Ed.), *The textbook of clinical sexual medicine* (pp. 507-524). Springer International Publishing. DOI 10.1007/978-3-319-52539-6. [18 pages].

Levin, R. J. (2017). The human sexual response cycle. In W. W. IsHak (Ed.), *The textbook of clinical sexual medicine* (39-51). Springer International Publishing. DOI 10.1007/978-3-319-52539-6. [13 pages].

Lewis, J. & Scott, E. (1997). The sexual education needs of those disabled by mental illness. *Psychiatric rehabilitation journal*, Vol. 21, No. 2, pp. 164-167. [4 pages].

Liu-Seifert, H., Kinon, B. J., Tennant, C. J., Sniadecki, J. & Volavka, J. (2009). Sexual dysfunction in patients with schizophrenia treated with conventional antipsychotics or risperidone. *Neuropsychiatric disease and treatment*, 5, 47-54. [8 pages].

Lukoff, D., Gioia-Hasick, D., Sullivan, G., Golden, J. S. & Nuechterlein, K. H. (1986). Sex education and rehabilitation with schizophrenic male outpatients. *Schizophrenia Bulletin*, 12:4, 669-677. [8 pages].

Lyketsos, G. C., Sakka, P. & Maïlis, A. (1983). The sexual adjustment of chronic schizophrenics: A preliminary study. *Brit. J. Psychiat*, 143, 376-382.[7 pages].

Macdonald, S., Halliday, J., MacEwan, T., Sharkey, V., Farrington, S., Wall, S. & McCreadie, R. G. (2003). Nithsdale schizophrenia surveys 24: Sexual dysfunction. *British journal of psychiatry*, 182, 50-56. [7 pages].

Mahmoud, S. B., Zouari, L., Dammak, M., Thabet, J. B., Zouari, N. & Maâlej, M. (2012). Evaluation of sexuality in 61 subjects suffering from chronic psychosis. *Sexologies*, 22, pp. 59-63. http://dx.doi.org/10.1016/j.sexol.2012.08.002. [5 pages].

Marques, T. R., Smith, S., Bonaccorso, S., Gaughran, F., Kolliakou, A., Dazzan, P., Mondelli, V., Taylor, H., DiForti, M., McGuire, P. K., Murray, R. M. & Howes, O. D. (2012). Sexual dysfunction in people with prodromal or first-episode psychosis. *The British Journal of Psychiatry*, 201, 131-136, DOI: 10.1192/bjp.bp.111.101220 [6 pages].

Michopoulos, I., Arvanitakis, P., Theodoropoulou, P., Dimopoulou, K., Tzebelikos, E. & Kalkavoura, C. (2014). Hyperprolactinemia, psychopathology, and sexual functioning in schizophrenic patients. European Neuropsychopharmacology, 24:2, 561-562. [2 pages].

Miclutia, I.V., Popescu C. A. & Macrea, R. S. (2008). Sexual dysfunctions of chronic schizophrenic female patients. *Sex Relations Ther*, 23:2, 119-129. DOI: 10.1080/14681990701854654 [11 pages].

Miller, L. J. (1997). Sexuality, reproduction and family planning in women with schizophrenia. *Schizophrenia Bulletin*, Vol. 23, No. 4, pp. 623-635. [13 pages]

McCann, E. (2000). The expression of sexuality in people with psychosis: Breaking the taboos. *Journal of Advanced Nursing*, 32:1, 132-138. [7 pages].

McCann, E. (2010). The sexual and relationship needs of people who experience psychosis: quantitative findings of a UK study. Journal of psychiatric and mental health nursing, 17, 295-303. doi: 10.1111/j.1365-2850.2009.01522.x [9 pages].

Moukas, G., Gourzis, P., Beratis, I. N. & Beratis, S. (2010). Sex differences in prepsychotic "prodromal" symptomatology and its association with positive and negative syndrome scale active phase psychopathology in male and female patients. *Comprehensive Psychiatry*, 51, 546-551. doi:10.1016/j.comppsych.2009.11.003 [6 pages].

Nakhli, J., Sehli, J., Bouhlel, S., El kissi, Y., Ben Nasr, S. & Ben Hadj Ali, B. (2016). Sexuality of patients with schizophrenia: Gender differences. *Psychiatric department Farhat Hached University Hospital*, Sousse, Tunisia (Poster), 1. [1 page].

Nestoros, J. N., Lehmann, H. E. & Ban, T. A. (1981). Sexual behaviour of the male schizophrenic: The impact of illness and medications. *Archives of sexual behaviour*, Vol. 10, No. 5, pp. 421-442. [22 pages].

Olfson, M., Uttaro, T., Carson, W. H. & Tafesse, E. (2005). Male sexual function and quality of life in schizophrenia. *J Clin Psychiatry*, 66, 331-338. [8 pages].

Os, J. V., Kenis, G. & Rutten, B. P. F. (2010). The environment and schizophrenia. *Nature*, 468, 203–212. DOI:10.1038/nature09563. [10 pages].

Östman, M. & Björkman, A. C. (2013). Schizophrenia and relationships: The effect of mental

illness on sexuality. *Clinical schizophrenia and related psychoses*, 20-24. [5 pages].

Östman, M. (2014). Low satisfaction with sex life among people with severe mental illness living in a community. *Psychiatry Research*, 216, 340-345. http://dx.doi.org/10.1016/j.psychres.2014.02.009 [6 pages].

Owen, M. J., O´Donovan, M. C., Thapar, A. & Craddock, N. (2011). Neurodevelopmental hypothesis of schizophrenia. *The British Journal of Psychiatry*, 198, pp. 173-175. DOI: 10.1192/bjp.bp.110.084384 [3 pages].

Perkins, D. O. (2002). Predictors of non-compliance in patients with schizophrenia. *J Clin Psychiatry*, 63:12, 1121-1128. [8 pages].

Peuskens, J., Sienaert, P. & Hert, M. D. (1998). Sexual dysfunction: The unspoken side effect of antipsychotics. *Eur Psychiatry*, 13, 23-30. [8 pages].

Raboch, J. (1984). The sexual development and life of female schizophrenic patients. Archives of Sexual Behavior, 13:4, 341-349. [9 pages].

Rizvi, S. J., Yeung, N. W. & Kennedy, S. H. (2011). Instruments to measure sexual dysfunction in community and psychiatric populations. *Journal of Psychosomatic Research*, 70, 99-109. doi:10.1016/j.jpsychores.2010.05.009 [11 pages].

Schürhoff, F., Szöke, A., Bellivier, F., Turcas, C., Villemur, M., Tignol, J., Rouillon, F. & Leboyer, M. (2003). Anhedonia in schizophrenia: A distinct familial subtype? Schizophrenia Research, 61, 59-66. DOI:10.1016/S0920-9964(02)00237-2 [8 pages].

Shean, G. D. (2004). Understanding and treating schizophrenia: *Contemporary research, theory and practice*. The Haworth Clinical Practice Press, pp. 1-195 and pp. 265-292. [223 pages].

Shrout, P. E. & Lane, S. P. (2012). Reliability. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf & K. J. Sher (Eds.), *APA Handbook of Research Methods in Psychology* (1. Ed., Vol. 1. pp. 643-660). Washington, DC, American Psychological Association. DOI: 10.1037/13619-000. [18 pages].

Simiyon, M., Chandra, P. S. & Desai, G. (2016). Sexual dysfunction among women with

schizophrenia – a cross sectional study from India. *Asian Journal of Psychiatry*, 24, pp. 93-98. [6 pages].

Simon, W. & Gagnon, J. H. (1984). Sexual scripts. *Society*, 53-60. [8 pages].

Smith, G. T., Combs, J. L. & Pearson, C. M. (2012). Brief instruments and short forms. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf & K. J. Sher (Eds.), *APA Handbook of Research Methods in Psychology* (1. Ed., Vol. 1. pp. 395-409). Washington, DC, American Psychological Association. DOI: 10.1037/13619-000. [15 pages].

Smith, S. M., O'Keane, V. & Murray, R. (2002). Sexual dysfunction in patients taking conventional antipsychotic medication. *British Journal of Psychiatry*, 181, 49-55. [7 pages].

Snell, W. E., Fisher, T. D. & Walters, A. S. (1993). The multidimensional sexuality questionnaire: An objective self-report measure of psychological tendencies associated with human sexuality. Annals of sex research, 6, 27-55. [29 pages].

Stefanis, C. N. (1994). Schizophrenia: Neurobiological perspectives. *Progress in brain research*, 100, 267-272. [6 pages].

Strauss, J. S., Bowers, M. B. & Keith, S. J. (1982). What is schizophrenia? *Schizophrenia Bulletin*, 8:3, 433-437. [5 pages].

Tharoor, H., Kaliappan, A. & Gopal, S. (2015). Sexual dysfunctions in schizophrenia: Professionals and patients perspectives. *Indian journal of psychiatry*, 57:1, 85-87. [3 pages].

Volman, L. & Landeen, J. (2007). Uncovering the sexual self in people with schizophrenia. *Journal of psychiatric and mental health nursing*, 14, pp. 411-417. [7 pages].

Wasow, M. (1980). Sexuality and the institutionalised mentally ill. *Sexuality and disability*, 3:1, 3-16. [14 pages].

WHO ICD-10 (2016). Chapter V Mental and behavioural disorders, section F20-F29 Schizophrenia, schizotypal and delusional disorders. Accessed 24.10.2019 from: https://icd.who.int/browse10/2016/en#/F20-F29

WHO ICD-10 (2018). *Psykiske lidelser og adfærdsmæssige forstyrrelser – klassifikation og diagnostiske kriterier*. Munksgaard, 65-79. [15 pages].

Williamson, P. (2005). The evolving concept of schizophrenia. *Mind, Brain and Schizophrenia*,

3-13. [11 pages].

Wolf, D. H. (2006). Anhedonia in Schizophrenia. *Current Psychiatry Reports*, 8, 322-328 [7 pages].

Yee, O. K., Ramli, E. R. M. & Ismail, H. C. (2014). Remitted male schizophrenia patients with sexual dysfunction. *Journal of Sexual Medicine*, 11, 956-965. DOI: 10.1111/jsm.12246 [10 pages].

Literature from previous courses

Brace, N., Kemp, R. & Snelgar, R. (2012). *SPSS for psychologists* (5th edition). Palgrave Macmillan, [214 pages].

Coolican, H. (2014). *Research methods and statistics in psychology (*6th edition). Psychology Press. [488 pages].

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