

Metacognitions in heterosexual, bisexual, and homosexual men: With or without premature ejaculation and erectile dysfunction

Lawless, P.; Allen, A.; Kannis-Dymand, Lee; Lovell, Geoff

Published in:

Behavioural and Cognitive Psychotherapy

Publication date:

2021

The re-use license for this item is:

CC BY-NC-ND

This document version is the:

Peer reviewed version

The final published version is available direct from the publisher website at:
[10.1017/S1352465820000879](https://doi.org/10.1017/S1352465820000879)

Find this output at Hartpury Pure

Citation for published version (APA):

Lawless, P., Allen, A., Kannis-Dymand, L., & Lovell, G. (2021). Metacognitions in heterosexual, bisexual, and homosexual men: With or without premature ejaculation and erectile dysfunction. *Behavioural and Cognitive Psychotherapy*, 49(5), 612-625. <https://doi.org/10.1017/S1352465820000879>

METACOGNITIONS AND SEXUAL DYSFUNCTION

1

Abstract

Background: Premature ejaculation (PE) and erectile dysfunction (ED) are prevalent sexual problems, with evidence to suggest variation across sexual orientation. Contributing factors have traditionally been divided into organic and psychological categories. While limited research has found support for the influence of metacognitive beliefs, these studies did not investigate potential differences in sexual orientation.

Aim: The current study aimed to investigate the differences in metacognitive beliefs in men with or without PE and/or ED and whether these varied according to sexual orientation.

Method: A sample of 531 men was recruited (65 met criteria for PE only, 147 for ED, 83 with PE and ED, and 236 healthy controls). Within this sample, 188 men identified as heterosexual, 144 as bisexual, and 199 as homosexual. Participants completed a cross-sectional online survey comprised of psychometric measures.

Results: Participants with PE and ED were significantly higher in the cognitive confidence, thoughts concerning uncontrollability and danger, and the need to control thoughts than PE only, ED only, and healthy controls. Further, the PE only group was significantly higher than healthy controls for cognitive confidence, with the ED significantly higher for thoughts concerning uncontrollability and danger. There were no significant differences between differing sexual orientations for men with/or without PE and/or ED.

Conclusions: Congruent with previous research, metacognitive beliefs play a role in PE and/or ED. Although, this is not exclusive to sexual orientation. The findings highlight that assessment and intervention regarding metacognitive beliefs may be beneficial for men of all sexual orientations with PE and/or ED.

Keywords: Metacognition, metacognitive beliefs, premature ejaculation, erectile dysfunction, sexual orientation, sexual dysfunction.

Metacognitions in Heterosexual, Bisexual, and Homosexual Men:
With or Without Premature Ejaculation and Erectile Dysfunction

Introduction

Sexual dysfunctions represent a diverse class of disorders (Frühauf, Gerger, Schmidt, Munder, & Barth, 2013). Premature ejaculation (PE; **i.e., ejaculating sooner than desired**) and erectile dysfunction (ED; **i.e., the inability to obtain and retain an erection for sex**) are the two most ubiquitous sexual dysfunctions experienced by men (Nicolosi et al., 2003; Porst et al., 2007; Quek, Sallam, Ng, & Chua, 2008). Prevalence rates for PE and ED vary depending on assessment criteria and methodologies (e.g., varying psychometric measures, multifactorial genesis, pathological standards; McDonagh, Bishop, Brockman, & Morrison, 2014; Nicolini, Tramacere, Parmigiani, & Dadomo, 2018). Colson, Cuzin, Faix, Grellet, and Huyghes's (2018b) analysis of epidemiological data found rates of ED varying 1-9% from 18 to 39 years; 2-30% from 40 to 59 years; 20-40% from 60 to 69 years; and 50-75% over 70 years of age. Evidently, increased age is an independent risk factor for ED (Colson, Cuzin, Faix, Grellet, & Huyghes's, 2018a; Nicolosi et al., 2003). In contrast, rates of PE vary from 3% to 30% (Altholf et al., 2014; Komlenac, Siller, Bliem, & Hochleitner, 2018; Porst et al., 2007). Substantial rates of comorbid PE and ED have also been established (Chen, Wang, Hu, Yang, & Dai, 2018; McMahon, Lee, Park, & Adaikan, 2012; Quek et al., 2008), with the incidence of ED found in over half of men with PE (Serefoglu et al., 2014). Interestingly, research indicates possible differences in prevalence rates of PE and ED across sexual orientations (McDonagh, Nielsen, McDermott, Davies, & Morrison, 2018). That is, higher rates of ED and lower rates of PE in homosexual men compared with heterosexual men (Bancroft, Carnes, Janssen, Goodrich, & Long, 2005; Peixoto & Nobre, 2015). Yet, potential differences compared to bisexual men remain unclear. **Such findings may be explained by sexual concerns specific to gay men (e.g., perceived masculinity; HIV transmission; painful anal**

sex; performance anxiety) that impact erection quality and the possible distress of premature ejaculation due to expectations of heterosexual men (e.g., negative impact on partners enjoyment; Bancroft et al., 2005; McDonagh et al. 2018; Peixoto & Nobre, 2015).

PE and ED Aetiology

Contributing factors in PE and ED have been conventionally divided into organic and psychological classifications. However, the distinction between the two categories is not definitive as these factors can overlap for individuals (Rajkumar & Kumaran, 2015). Regarding psychological issues, anxiety and depression are implicated in the development and maintenance of sexual dysfunctions, including PE and ED (Chen, Chen et al., 2018; Chen, Wang et al., 2018; Mourikis et al., 2015). Though, research has highlighted that PE and ED may be differentially influenced by anxiety and depression symptomology (Sugimori et al., 2005). For example, whilst depression has been found to play a role in both PE and ED, performance and free-floating anxiety (i.e., worry without an external threat) are recognised as prominent contributors to the development and maintenance of ED (Mourikis et al., 2015). It is worth noting that homosexual, bisexual, and other same-sex attracted people are at a higher risk of mental health issues including depression and anxiety, with research supporting significant positive associations between minority stress and psychological distress (Lea, de Wit, & Reynolds, 2014). Similarly, comorbid PE and ED are associated with higher levels of psychological distress (Chen, Wang et al., 2018). Taken together, factors that are relevant to both emotional dysregulation and sexual dysfunction, such as cognition, have clinical value in treatment planning for PE and ED across sexual orientations.

Metacognitive Theory

Recently, emerging research has focused on the contribution of metacognitive factors in emotional distress and sexual dysfunction (Bagcioglu et al., 2012; Guiri et al., 2016; Zarbo et al., 2019). Metacognition refers to knowledge of one's cognitive processes (i.e., thinking

METACOGNITIONS AND SEXUAL DYSFUNCTION

4

1
2
3 about thinking) and, accordingly, is involved in the appraisal, monitoring, or control of
4
5 cognition (Flavell, 1979; Yılmaz, Gençöz, & Wells, 2011). The metacognitive model of
6
7 psychological disorder, the Self-Regulatory Executive Function Model (S-REF; Wells &
8
9 Mathews, 1994; 1996), proposes that psychological distress is caused and maintained
10
11 perseverative thinking that occurs in the form of cognitive-attentional syndrome (CAS),
12
13 comprised of worry, rumination, fixated attention, and unhelpful self-regulatory strategies
14
15 (Wells, 2013). This style of thinking is considered problematic as it allows negative thoughts
16
17 and emotions to persist, which then prevents the modification of dysfunctional self-beliefs
18
19 and increases the accessibility of negative information (Caselli & Spada, 2013).

20
21
22
23
24 The CAS is controlled by metacognitive beliefs about thinking, which are primarily
25
26 divided into two domains: Positive metacognitive beliefs and negative metacognitive beliefs
27
28 (Wells, 2009). Positive metacognitive beliefs concern the perceived benefit of engaging in
29
30 rumination, worry, threat monitoring, thought suppression, and other similar strategies
31
32 (Wells, 2013). For example, “if I worry, I will be prepared” or “focusing on danger will keep
33
34 me safe” (Wells, 2009, p. 15). Alternatively, negative metacognitive beliefs consist of two
35
36 broad domains, (1) those that concern the uncontrollability of thoughts and (2) those that
37
38 concern the danger, importance, and meaning of them (Wells, 2011). For example, “I have no
39
40 control over my worrying” and “psychological distress can make me lose my mind” (Wells,
41
42 2009, p. 16). It is through the adoption of these metacognitive patterns and coping strategies
43
44 that individuals develop and maintain psychological conditions (Wells, 2009).
45
46
47
48

Relevant Research

49
50
51 Substantial research has established that metacognitive beliefs and processes are
52
53 implicated in a range psychological problems, including anxiety (Bailey & Wells, 2015;
54
55 Wells 2013), addictive behaviours (Allen et al., 2017; Caselli & Spada, 2013; Hamonniere &
56
57 Varescon, 2018), anger (Ramos-Cejudo et al., 2017; Simpson & Papageorgiou, 2003), and
58
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

5

1
2
3 depression (Papageorgiou & Wells, 2001; 2003). Moreover, a recent meta-analysis reported
4
5 that those with a psychological disorder, including generalized anxiety disorder, eating
6
7 disorders, major depressive disorder, schizophrenia, or obsessive-compulsive disorder had
8
9 increased levels of metacognitive beliefs compared to healthy controls (Sun, Zhu, & So,
10
11 2017). Thus, it is plausible that metacognitions are related to emotional distress experienced
12
13 by sexual minorities and individuals who struggled with sexual dysfunction.
14
15

16
17 Currently, there is limited research exploring the role of metacognitions in PE and ED,
18
19 with only two published studies to date. First, Bagcioglu and colleagues (2012) investigated
20
21 metacognitive processes of 40 participants with ED and 40 participants with PE who were
22
23 diagnosed using a semi-structured interview based on the DSM- IV-TR and compared with
24
25 40 healthy controls. The short form of the Metacognition Questionnaire (MCQ-30; Wells &
26
27 Cartwright-Hatton, 2004) was used to evaluate the presence of both positive and negative
28
29 metacognitive beliefs and maladaptive coping strategies (e.g., excessive focus on thoughts or
30
31 over-reliance on worry). Bagcioglu and colleagues (2012) found that positive beliefs and
32
33 negative beliefs subscale scores were significantly higher in participants with PE or ED than
34
35 healthy controls with no significant difference between the PE or ED groups. There were no
36
37 significant differences between the groups on the uncontrollability-danger and cognitive
38
39 confidence subscale scores. However, the cognitive self-consciousness was significantly
40
41 higher in participants with PE than participants with ED and healthy controls; whilst there
42
43 was no difference between participants with ED and healthy controls. The researchers
44
45 proposed that this difference may be due to participants with ED being significantly older
46
47 than participants with PE and the healthy control group. Bagcioglu et al. stated that their
48
49 study highlighted that metacognitions may play a role in PE and ED through the development
50
51 of maladaptive metacognitive coping strategies associated with higher endorsement of
52
53 positive and negative metacognitive beliefs.
54
55
56
57
58
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

6

1
2
3 The second study by Guiri et al. (2016) investigated metacognitive beliefs and the
4 processes of the CAS in 11 participants with ED and 10 with PE (DSM-IV criteria). A semi-
5 structured interview based on Well's (2000) metacognitive profiling interview was utilised to
6 evaluate the presence of metacognitive beliefs concerning a recent episode of sexual
7 dysfunction. Guiri et al. concluded, that the results of their study indicated that positive and
8 negative metacognitive beliefs and the CAS may play a role in the maintenance of sexual
9 dysfunction and in the exacerbation of negative emotional states. For example, participants
10 held negative metacognitive beliefs about the uncontrollability of thoughts (i.e., "the negative
11 thoughts keep coming back") and the negative impact of their CAS thought patterns (i.e.,
12 "worrying doesn't help me get an erection"), which may play a role in promoting negative
13 affect and loss of arousal that in turn may further exacerbate CAS. Further, these findings
14 highlighted that there may be both differences and similarities in the CAS models of men
15 with ED or PE. For example, ED participants reported higher CAS activation in the form of
16 rumination or worry. PE participants reported higher negative appraisal of triggers and the
17 activation of thought control strategies, such as seeking distraction or using suppression, in an
18 attempt to move their attention away from negative thoughts or physical sensations.
19 However, the possibility that individual participants may have been affected by more than
20 one kind of sexual dysfunction was deemed to be a limitation in this study, because this may
21 have confounded the support for differential metacognitive profiles corresponding to a single
22 diagnoses only.
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48

49 Both Guiri et al. (2016) and by Bagcioglu et al. (2012) stated that their studies were
50 exploratory and highlighted the small sample sizes and the necessity for future research to
51 recruit a larger number of participants. Additionally, they encouraged the adoption of
52 validated psychometric measures for all variables to enable the collection of robust data to
53 compare with their findings. Importantly, neither the Guiri et al. or Bagcioglu et al. study
54
55
56
57
58
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

7

investigated the sexual orientation of the participants and there appears to be no published research investigating whether metacognitive processes vary in PE and ED according to sexual orientation. Therefore, given that previous research highlights variances in rates of PE and ED between heterosexual, bisexual, and homosexual men, it would be beneficial to investigate this regarding metacognition.

The Present Study

Building on the research of Bagcioglu et al. (2016) and Guiri et al. (2012), implementing their suggestions, and addressing the gap in the literature regarding sexual orientation, the current study investigated the differences in metacognitive processes in heterosexual, bisexual, and homosexual men with PE and/or ED compared to healthy controls using validated psychometric measures. Specifically, it was hypothesised that metacognitive beliefs reported by participants with PE and/or ED would be significantly higher than participants without PE and/or ED. A second aim of the study was to explore potential significant differences in metacognitive beliefs reported by heterosexual, homosexual, and bisexual participants with PE and/or ED.

Method**Design and Procedure**

The study implemented a cross-sectional, online survey design. Following ethical approval from a university board, male participants ≥ 18 years were recruited via social networking and sexual health websites with a survey link. Volunteers who accessed the link were informed of the study's purpose, length (i.e., 20 minutes), risks, and safeguards, along with information about consent, anonymous participation, and access to information. The study was described as an investigation of thoughts processes associated with ED and PE. After obtaining consent, participants were invited to complete the demographic questionnaire followed by psychometric measures. All participants were provided with the contact details

METACOGNITIONS AND SEXUAL DYSFUNCTION

8

of suitable support services pre- and post-completion to assist with any distress experienced during participation. Participants were also able to leave the survey at any time without consequence.

Participants

A total of 731 participants undertook the survey, with 531 complete responses included in the MANCOVA. Sixty-five participants satisfied the criteria for PE (12.2%), 147 for ED (27.7%), 83 with PE and ED (15.6%), and 236 with neither (44.4%; referred to as healthy controls). Analysis of total responses revealed that complete responders were significantly older ($M = 42.63$ years, $SD = 14.34$) than partial responders ($M = 39.98$ years, $SD = 15.06$), $t(729) = -2.196$ (2-tailed), $p = .028$, partial $\eta^2 = .007$. There was no significant difference in sexual orientation between complete (heterosexual = 35.4%, bisexual = 27.1%, homosexual = 37.5%) and partial responders (heterosexual = 34.6%, bisexual = 26.2%, homosexual = 39.3%), $\chi^2(-2) = .194$, $p = .908$. Details of the participants are provided in Tables 1 and 2.

Insert Table 1 and Table 2**Measures**

Sexual orientation. As a multidimensional construct, sexual orientation is often conceptualized as one aspect of human sexuality (Pachankis et al., 2017). For the current study, sexual orientation was gauged using a self-report measure of sexual attraction. Self-reported sexual attraction has been found to differ from sexual identity (Diamond, Dickenson, & Blair, 2017), and may be associated with greater honesty in responses (Smith, Rissel, Richters, Grulich, & de Visser, 2003). Therefore, a sexual attraction question was employed as recommended by the Sexual Minority Assessment Research Team (SMART, 2009): “People are different in their sexual attraction to other people. Which best describes your feelings? Are you: 1. Only attracted to females; 2. Mostly attracted to females, 3. Equally attracted to females and males; 4. Mostly attracted to males; 5. Only attracted to males”? For

1
2
3 the purpose of the current research, responses were coded as: 1 = heterosexual; 2, 3, and 4 =
4
5 bisexual; and response 5 = homosexual.
6

7
8 **Ejaculation control.** The Premature Ejaculation Diagnostic Tool (PEDT 5; Symonds
9
10 et al., 2007a) is a 5-item measure for assessing premature ejaculation (e.g., “How difficult is
11
12 it for you to delay ejaculation?”). Respondents rate items on a 5-point Likert scale 0 (*not at*
13
14 *all*) – 4 (*extremely*). Total scores range from 0 – 20, with higher scores indicating poorer
15
16 control over ejaculation. The PEDT 5 is extensively validated, with good internal consistency
17
18 ($\alpha = 0.71$) and test-retest reliability ($\alpha = 0.88$; Symonds et al., 2007b). Cut-offs were scored at
19
20 0 – 8 as indicating without PE and 9 and above indicating with PE (Pakpour, Yekaninejad,
21
22 Nikoobakht, Burri, & Fridlund, 2014; Breyer et al., 2010).
23
24

25
26 **Erectile function.** The Sexual Experiences Questionnaire (SEX-Q) is a validated
27
28 questionnaire used to measure erectile function, individual satisfaction, and couple’s
29
30 satisfaction (Mulhall et al., 2007; Cappelleri, Bushmakin, Symonds, & Schnetzler, 2009). The
31
32 erection function subscale of the SEX-Q was used as a measure of erectile function as other
33
34 questionnaires were primarily developed for heterosexual men with the assumption of
35
36 penetrative vaginal sex (Coyne et al., 2010) and the SEX-Q erection function subscale had
37
38 only one question that focused on penetration. Further, not all men who have sex with men
39
40 practice penetrative anal sex, and, further, they may play the passive or active role only, or
41
42 both (Vansintejan, Vandevorde, & Devroey, 2013). The wording for sexual
43
44 intercourse/penetration was expanded to include “entering your partner’s mouth, vagina, or
45
46 anus” (Breyer et al., 2010). The erectile function subscale contains 6 items measured on a 5-
47
48 point Likert Scale 1 (*never or almost never*) to 5 (*almost always or always*). A sample item is
49
50 “How often were you able to maintain an erection for as long as you wanted to?”. Scores are
51
52 converted to percentages with lower scores representing higher ED. The erectile domain of
53
54 the SEX-Q has demonstrated high internal consistency ($\alpha = .88$) and good test-retest
55
56
57
58
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

10

1
2
3 reliability ($\alpha = .76$; Mulhall et al., 2007). Cut-offs were scored at 0 - 67% indicating with ED
4 and 68% and above without ED (Cappelleri et al., 2009).

5
6
7
8 **Metacognitions.** The Metacognition Questionnaire-30 (MCQ-30; Wells & Cartwright-
9 Hatton, 2004) is a well-validated brief 30-item version of the 65-item Metacognition
10 Questionnaire for assessing metacognitions. A sample item is “When I start to worry, I
11 cannot stop”. Respondents indicate their agreement with each item on a 4-point Likert scale
12 from 1 (*do not agree*) to 4 (*agree very much*). The questionnaire has an overall score (30-
13 120) and five subscale scores (6-24) The five subscales are (1) cognitive confidence, which
14 assesses the confidence a person has in their attention and memory; (2) positive beliefs about
15 worry, which measures the extent to which a person believes that perseverative thinking is
16 useful; (3) cognitive self-consciousness, which measures the tendency to monitor one’s
17 thoughts and focus attention inward; (4) beliefs about the uncontrollability and danger of
18 thoughts, which assesses the extent to which a person thinks that perseverative thinking is
19 uncontrollable and dangerous; and (5) negative beliefs - the need to control thoughts, which
20 assesses the extent to which a person believes that certain types of thoughts need to be
21 suppressed. Higher scores indicate **lower cognitive** confidence in attention and memory,
22 greater belief that worry is beneficial, increased tendency towards self-focused attention,
23 greater belief that thoughts are uncontrollable and dangerous, and a greater belief in the need
24 to control thoughts, respectively. The MCQ-30 possesses good internal consistency and
25 convergent validity as well as acceptable test-retest reliability ($\alpha = .59-.87$; Spada, Georgiou,
26 & Wells, 2010; Wells & Cartwright-Hatton, 2004).

Data Analysis

27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54 To assess the first and second hypotheses, a single between participants two-way
55 (sexual orientation: heterosexual, bisexual, and homosexual, by sexual dysfunction: healthy
56 control, ED only, PE only, and PE with ED) Multivariate Analyses of Covariance
57
58
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

11

(MANCOVA) was calculated, with the 5 subscales of the MCQ-30 representing multiple dependent variables. Age was entered as a covariate as it is an independent risk factor for ED (Colson et al., 2018a). After significant MANCOVA effects or interactions, posthoc analyses were undertaken to assess differences between cell and marginal means where appropriate. There were no issues with multicollinearity.

Results

Numerous *a priori* G*Power 3.1 calculations, dependent on the type of statistical analysis to be undertaken, indicated a sample size of $N = 120-196$ to achieve a medium population effect size ($f = .25$), power of .80 ($\beta = .20$), and significance criterion $\alpha = .05$. However, these calculations did not take into consideration the high variability of the distribution of the groups (i.e., heterosexual, bisexual, and homosexual males) within the general population. Accordingly, as suggested by Wilson, VanVooris, and Morgan (2007), approximately 30 participants per group were required to achieve a medium to large effect size with about 80% power. However, in the current study, not all groups achieved this goal and varied in size. According to Tabachnik and Fidell (2013), when there are unequal sample sizes across the groups, then multivariate analysis of covariance (MANCOVA) are considered robust against such challenges.

Data Screening

Data was exported from the Survey Monkey platform to IBM *Statistical Product and Service Solutions* (SPSS) program version 26 for analysis. All data were screened, and incomplete responses were removed. Data had significant Shapiro-Wilks test of normality, however, MANCOVA is robust against violations of the normality assumption when groups exceed 30 (Field, 2013). Multicollinearity was not violated – all correlations were below .90. Box's test of Covariance Matrices significance was above alpha of .001. An examination of box-plots and z-scores revealed a total of 20 univariate outliers. However, the extreme nature

METACOGNITIONS AND SEXUAL DYSFUNCTION

12

of standardized scores depends on the size of the sample and, in larger samples, a few standardized scores in excess of ± 3.29 are acceptable. Upon inspection, the univariate outliers were considered a part of the population and were retained for further analysis (Tabachnick & Fidell, 2013).

Differences in Metacognitions

Results of the MANCOVA to examine the differences in metacognitions across sexual orientation and of sexual dysfunction groups indicated that there was a significant multivariate main effect for both sexual dysfunction (Wilks Lambda = .895, $F(15, 1419.33) = 3.87$ $p < .001$, partial $\eta^2 = .036$, observed power = 1.00) and for sexual orientation (Wilks Lambda = .945, $F(10, 1028) = 2.97$ $p = .001$, partial $\eta^2 = .028$, observed power = .982). However, the interaction between sexual dysfunction and sexual orientation was non-significant (Wilks Lambda = .951, $F(30, 2058) = .864$ $p = .679$, partial $\eta^2 = .010$, observed power = .696).

Significant univariate main effects of sexual dysfunction on the MCQ-30 subscales were identified for cognitive confidence $F(1, 518) = 10.119$ $p < .001$, partial $\eta^2 = .055$, observed power = .998; thoughts concerning uncontrollability and danger $F(3, 518) = 10.734$ $p < .001$, partial $\eta^2 = .059$, observed power = .999; and negative beliefs – need to control thoughts $F(3, 518) = 4.457$ $p = .004$, partial $\eta^2 = .025$, observed power = .878. Table 3 shows mean (M) and standard deviation (SD), sexual orientation, MCQ-30 subscale, and sexual dysfunction scores.

Insert Table 3

Table 4 shows the mean difference between sexual dysfunction groups and significance level for the MCQ-30 subscale, and 95% confidence interval for the mean difference. Regarding cognitive confidence, results indicated that the PE and ED group score was significantly higher than ED only, PE only, and healthy controls groups, and the PE only

METACOGNITIONS AND SEXUAL DYSFUNCTION

13

1
2
3 group score was significantly higher than the healthy control group; there were no other
4
5 significant differences. Regarding thoughts concerning uncontrollability and danger, results
6
7 indicated that the PE and ED group score was significantly higher than ED only, PE only, and
8
9 healthy controls groups, and the ED only group score was significantly higher than the
10
11 healthy control group; there were no other significant differences. Regarding negative beliefs
12
13 - need to control thoughts, results indicated that the PE and ED group score was significantly
14
15 higher than the healthy controls group; there were no other significant differences.
16
17
18

Insert Table 4

21
22 Significant univariate main effects of sexual orientation on the MCQ-30 subscales
23
24 were identified for thoughts concerning uncontrollability and danger only $F(2, 518) = 4.728$ p
25
26 = .009, partial $\eta^2 = .018$, observed power = .998); whilst positive beliefs $F(2, 518) = 2.957$ p
27
28 = .053 partial $\eta^2 = .011$, observed power = .575 approached significance. Details of mean (M)
29
30 of sexual orientation for MCQ-30 subscales and sexual dysfunction are shown in Table 5 and
31
32 the mean difference between sexual orientation and significance level for the MCQ-30
33
34 subscale and 95% confidence interval for the mean difference are shown in Table 6.
35
36 Regarding thoughts concerning uncontrollability and danger, results indicated that the
37
38 homosexual men's score was significantly higher than heterosexual men, there were no other
39
40 significant differences. Regarding positive beliefs, results indicated that the homosexual
41
42 men's scores was significantly higher than heterosexual men, there were no other significant
43
44 differences. Also, results indicated that bisexual men reported significantly higher levels of
45
46 low cognitive confidence than homosexual men.
47
48
49

Insert table 5 and Table 6**Discussion**

56
57 The current study aimed to investigate the differences in metacognitive processes in
58
59 heterosexual, bisexual, and homosexual men with PE and/or ED compared to healthy
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

14

1
2
3 controls. It was hypothesised that the metacognitive beliefs reported by participants with PE
4
5 and/or ED would be significantly higher than participants without PE and/or ED. Results
6
7 from this current study partially supported this hypothesis in that specific types of
8
9 metacognitive beliefs were significantly higher for participants with PE and/or ED than
10
11 without PE and/or ED. That is, participants with PE and ED were significantly higher in the
12
13 cognitive confidence, thoughts concerning uncontrollability and danger, and the need to
14
15 control thoughts subscales than PE only, ED only, and healthy controls. Further, the PE only
16
17 group was significantly higher than healthy controls for cognitive confidence, with the ED
18
19 significantly higher for thoughts concerning uncontrollability and danger subscales.
20
21
22
23

24 Therefore, the findings of this study suggest that specific metacognitive beliefs may be
25
26 involved in PE and ED. Reduced levels of cognitive confidence have been associated with
27
28 increased anxiety by possibly limiting the choice of effective coping strategies when under
29
30 stress (Spada, Georgiou, & Wells, 2010). Further, this may reflect low levels of belief in the
31
32 effectiveness of cognitive abilities and may lead to a cycle of failure, which could, in turn,
33
34 increase sexual dysfunction such as PE or ED (Bagcioglu et al., 2012; Spada, Zandvoort, &
35
36 Wells, 2007). Also, high levels of concern about uncontrollability and danger and the need to
37
38 control thoughts have been found to lead to the utilization of unhelpful coping strategies with
39
40 a focus being centred on controlling thoughts along with the anxious anticipation of failure
41
42 (Bagcioglu et al., 2012). Paradoxically, attempts to control thoughts or worries has been
43
44 found to increase their salience and associated distress (Cook et al., 2014). Also, according to
45
46 Spada et al. (2010) the combination of low levels of cognitive confidence and high levels of
47
48 concern about the uncontrollability and danger and the need to control thoughts, as seen in
49
50 the PE and ED group, has been found to increase levels of state anxiety.
51
52
53
54
55

56 Regarding the differences in the specific types of metacognitive beliefs between the
57
58 sexual dysfunction groups, Guiri et al. (2016) found that strategies to control either PE or ED
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

15

1
2
3 had a detrimental effect on the other (e.g., “using distraction to control my PE makes my
4 erection weaker”), which may lead to increased negative metacognitive beliefs and lower
5 confidence in coping strategies as found in the PE and ED group. Further, the differences in
6 the specific metacognitive beliefs found for PE and ED only groups may reflect the focus of
7 the PE only group on their lack of confidence in their strategies to control their PE (e.g.,
8 “Distraction doesn’t help me fix things”; Guiri et al., 2016). Whilst the ED only group may
9 be more focused on the uncontrollability of their thoughts and the negative consequences on
10 their erections (e.g., “I have no control over the worry”; “It keeps my attention on my flabby
11 penis and I can’t get an erection”; Guiri et al.). Both Guiri et al. and Bagcioglu et al. found
12 differing associations for metacognitive beliefs with PE and ED.
13
14
15
16
17
18
19
20
21
22
23
24
25

26 Considering the second aim of the study, there were no significant differences for
27 metacognitive beliefs between differing sexual orientations for men with/or without PE
28 and/or ED. This result may reflect previous findings regarding the complexity of human
29 sexuality and the difficulties in how sexual orientation is categorized (Pachankis et al., 2017).
30 Whilst a sexual attraction measure was used for this research, future research may benefit
31 from exploring different measures. However, results evidenced significant differences
32 relating to sexual orientation and metacognitive beliefs. Homosexual men were found to have
33 higher levels of distress concerning the uncontrollability and danger of thoughts, and positive
34 beliefs about the benefits of worry, and were significantly lower than bisexual men in
35 cognitive confidence which may reflect greater confidence in the use and the benefit of
36 coping strategies. This result appears to be consistent with previous research findings of
37 increased levels of psychological disorders, including depression and anxiety, for sexual
38 minority groups including homosexual and bisexual men (e.g., Lea et al., 2014). Currently,
39 there has been minimal research investigating the differences in metacognitive beliefs for
40 differing sexual orientations, warranting further research.
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

16

1
2
3 The results of this study highlight that metacognitive beliefs may play a role in PE
4 and/or ED. Further, whilst metacognitive beliefs may vary based on sexual orientation, it
5 would appear that sexual orientation does not play a role in metacognitive beliefs related to
6 PE and/or ED. From a therapeutic perspective, these findings suggest that the techniques and
7 principals of metacognitive therapy (Wells, 2000; 2009) may be beneficial for men with PE
8 and/or ED. However, the current results indicate that the modification of such therapy
9 depending on sexual orientation may not be necessary; however, this requires further research
10 attention.
11
12
13
14
15
16
17
18
19
20

21 The findings of the current study should be considered in the context of several
22 limitations. First, the study employed a cross-sectional internet survey design, with a sample
23 that was primarily Caucasian with higher education degrees. Thus, the results may not be
24 generalisable to the broader population, nor could causal inferences be supported. Second, the
25 use of self-report, internet-based and retrospective measures may result in biased responses
26 due to social desirability, self-report bias, and selective or poor memory. Third, participants'
27 anxiety and depression were not explicitly assessed. However, beliefs regarding worry
28 provide an implicit measure of anxiety. Regardless, future studies may benefit from including
29 validated measures of anxiety and depression and investigating the relationships between
30 anxiety and depression with PE and ED, as well as, interactions with metacognitive beliefs.
31 Additionally, the current study used the MCQ-30, which is a measure of generalised
32 metacognitive beliefs rather than a validated measure of metacognitive beliefs specific to
33 sexual dysfunction. Future studies would also benefit from larger sample sizes for various
34 sexual orientation groups.
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52

Summary

53
54
55
56 Given a paucity in research, the present study represents a significant contribution to
57
58 the literature, providing further support for the implications of metacognitive beliefs in sexual
59
60

METACOGNITIONS AND SEXUAL DYSFUNCTION

17

1
2
3 dysfunctions such as PE and/or ED. Furthermore, this research provides further support for
4
5 the S-REF model and metacognitive theory in the understanding of psychopathology,
6
7 including sexual distress associated with male sexual dysfunction. Our findings, collectively
8
9 with the previous work of Bagcioglu et al. (2012) and Guiri et al. (2016), establishes that the
10
11 CAS and metacognitive beliefs are active in male sexual performance difficulties across
12
13 sexual orientations.
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review

References

- Allen, A., Kannis-Dymand, L., & Katsikitis, M.** (2017). Problematic internet pornography use: The role of craving, desire thinking, and metacognition. *Addictive Behaviors, 70*, 65-71. doi:10.1016/j.addbeh.2017.02.001
- Althof, S. E., McMahon, C. G., Waldinger, M. D., Serefoglu, E. C., Shindel, A. W., Adaikan, P. G., . . . Torres, L. O.** (2014). An update of the International Society of Sexual Medicine's guidelines for the diagnosis and treatment of premature ejaculation (PE). *Journal of Sexual Medicine, 11*, 1392-1422. doi:10.1111/jsm.12504
- Bagcioglu, E., Altunoluk, B., Bez, Y., Soylemez, H., Asik, A., & Emul, M.** (2012). Metacognition in patients with premature ejaculation and erectile dysfunction. *Journal of Cognitive and Behavioral Psychotherapies, 12*, 77-84. Retrieved from <https://search-proquest-com.ezproxy.usc.edu.au/docview/1010384508?accountid=28745>
- Bailey, R., & Wells, A.** (2015). Development and initial validation of a measure of metacognitive beliefs in health anxiety: The MCQ-HA. *Psychiatry Research, 230*, 871 – 877. doi:10.1016/j.psychres.2015.11.035
- Bancroft, J., Carnes, L., Janssen, E., Goodrich, D., & Long, J. S.** (2005). Erectile and ejaculatory problems in gay and heterosexual men. *Archives of Sexual Behavior, 34*, 285-297. doi:10.1007/s10508-005-3117-7
- Breyer, B. N., Smith, J. F., Eisenberg, M. L., Ando, K. A., Rowen, T. S., & Shindel, A. W.** (2010). The impact of sexual orientation on sexuality and sexual practices in North American medical students. *The Journal of Sexual Medicine, 7*, 2391-2400. doi:10.1111/j.1743-6109.2010.01794.x.
- Cappelleri, J. C., Bushmakin, A. G., Symonds, T., & Schnetzler, G.** (2009). Scoring correspondence in outcomes related to erectile dysfunction treatment on a 4-point scale

METACOGNITIONS AND SEXUAL DYSFUNCTION

19

(SCORE-4). *Journal of Sexual Medicine*, 6, 809-819. doi:10.1111/j.1743-6109.2008.01155.x

Caselli, G., & Spada, M. M. (2013). The metacognitions about desire thinking questionnaire: Development and psychometric properties. *Journal of Clinical Psychology*, 69, 1284-1298. doi:10.1002/jclp.21999

Chen, J., Chen, Y., Gao, Q., Chen, G., Dai, Y., Yao, Z., & Lu, Q. (2018). Impaired prefrontal-amygdala pathway, self-reported emotion, and erection in psychogenic erectile dysfunction patients with normal nocturnal erection. *Frontiers in Human Neuroscience*, 12. doi:10.3389/fnhum.2018.00157

Chen, X., Wang, F. X., Hu, C., Yang, N. Q., Dai, J. C. (2018). Penile sensory thresholds in subtypes of premature ejaculation: implications of comorbid erectile dysfunction. *Asian Journal of Andrology*, 20, 330-335 doi:10.4103/aja.aja_62_17

Colson, M. H., Cuzin, B., Faix, A., Grellet, L., & Huyghes, E. (2018a). Current epidemiology of erectile dysfunction, an update. *Sexologies: European Journal of Sexology and Sexual Health*, 27, e7-e13. doi:10.1016/j.sexol.2018.01.018

Colson, M. H., Cuzin, B., Faix, A., Grellet, L., & Huyghes, E. (2018b). Erectile dysfunction, twenty years after. *Sexologies: European Journal of Sexology and Sexual Health*, 27, e1-e6. doi:10.1016/j.sexol.2018.01.016

Cook, S. A., Salmon, P., Dunn, G., & Fisher, P. (2014). Measuring metacognition in cancer: Validation of the Metacognitions Questionnaire 30 (MCQ-30). *PLoS ONE*, 9, 1-8. doi:10.1371/journal.pone.0107302

Coyne, K., Mandalia, S., McCullough, S., Catalan, J., Noestlinger, C., Colebunders, R., & Asboe, D. (2010). The International Index of Erectile Function: Development of an adapted tool for use in HIV-positive men who have sex with men. *Journal of Sexual Medicine*, 7, 769-774 doi:10.1111/j.1743-6109.2009.01579.x

- 1
2
3 **Diamond, L. M., Dickenson, J. A., & Blair, K. L.** (2017). Stability of sexual attractions
4 across different timescales: The roles of bisexuality and gender. *Archives of Sexual*
5 *Behavior, 46*, 193-204. doi:10.1007/s10508-016-0860-x
6
7
8
9
10 **Field, A.** (2013). *Discovering statistics using IBM SPSS Statistics* (4th ed.). London: Sage.
11
12 **Flavell, J. H.** (1979). Metacognition and cognitive monitoring: A new area of cognitive–
13 developmental inquiry. *American Psychologist, 34*, 906-911. doi:10.1037/0003-
14 066X.34.10.90
15
16
17
18
19 **Frühauf, S., Gerger, H., Schmidt, H. M., Munder, T., & Barth, J.** (2013). Efficacy of
20 psychological interventions for sexual dysfunction: A systematic review and meta-
21 analysis. *Archives of Sexual Behavior, 42*, 915-933. doi:10.1007/s10508-012-0062-0
22
23
24
25
26 **Giuri, S., Caselli, G., Manfredi, C., Rebecchi, D., Granata, A., Ruggiero, G. M., &**
27 **Veronese, G.** (2016). Cognitive attentional syndrome and metacognitive beliefs in male
28 sexual dysfunction: An exploratory study. *American Journal of Men's Health, 1-8*. doi:
29 10.1177/1557988316652936
30
31
32
33
34
35 **Komlenac, N., Siller, H., Bliem, H. R., & Hochleitner, M.** (2018). Associations between
36 gender role conflict, sexual dysfunctions, and male patients' wish for physician–patient
37 conversations about sexual health. *Psychology of Men & Masculinity*. Advance online
38 publication. doi:10.1037/men0000162
39
40
41
42
43
44 **Lea, T., de Wit, J., & Reynolds, R.** (2014). Minority stress in lesbian, gay, and bisexual
45 young adults in Australia: Associations with psychological distress, suicidality, and
46 substance use. *Archives of Sexual Behavior, 43*, 1571-1578. doi:10.1007/s10508-014-
47 0266-6
48
49
50
51
52
53 **McDonagh, L. K., Bishop, C. J., Brockman, M., Morrison, T. G.** (2014). A systematic
54 review of sexual dysfunction measures for gay men: How do current measures measure
55 up? *Journal of Homosexuality, 61*, 781-816. doi:10.1080/00918369.2014.870452
56
57
58
59
60

McDonagh, L. K., Nielsen, E.-J., McDermott, D. T., Davies, N., & Morrison, T. G.

(2018). "I want to feel like a full man": Conceptualizing gay, bisexual, and heterosexual men's sexual difficulties. *Journal of Sex Research*, 55, 783-801.

doi:10.1080/00224499.2017.1410519

McMahon, C. G., Lee, G., Park, J. K., & Adaikan, P. G. (2012). Premature ejaculation

and erectile dysfunction prevalence and attitudes in the Asia-Pacific region. *The*

Journal of Sexual Medicine, 9, 454-465. doi:10.1111/j.1743-6109.2011.02507.x

Mourikis, I., Antoniou, M., Matsouka, E., Voursoura, E., Tzavara, C., Ekizoglou, C., . . .

Zervas, I. M. (2015). Anxiety and depression among Greek men with primary erectile dysfunction and premature ejaculation. *Annals of General Psychiatry*, 14.

doi:10.1186/s12991-015-0074-y

Mulhall, J. P., King, R., Kirby, M., Hvidsten, K., Symonds, T., Bushmakin, A. G., &

Cappelleri, J. C. (2008). Evaluating the sexual experience in men: Validation of the Sexual Experience Questionnaire. *The Journal of Sexual Medicine*, 5, 365-376.

doi:10.1111/j.1743-6109.2007.00694.x

Nicolini, Y., Tramacere, A., Parmigiani, S., & Dadomo, H. (2018). Back to stir it up:

Erectile dysfunction in an evolutionary, developmental, and clinical perspective. *The*

Journal of Sex Research, 56, 378-390. doi:10.1080/00224499.2018.1480743

Nicolosi, A., Moreira Jr, E. D., Shirai, M., Tambi, M. I. B. M., & Glasser, D. B. (2003).

Epidemiology of erectile dysfunction in four countries: cross-national study of the prevalence and correlates of erectile dysfunction. *Urology*, 61(1), 201-206.

doi:10.1016/S0090-4295(02)02102-7

Pachankis, J. E., Hatzenbuehler, M. L., Mirandola, M., Weatherburn, P., Berg, R. C.,

Marcus, U., & Schmidt, A. J. (2017). The geography of sexual orientation: Structural stigma and sexual attraction, behavior, and identity among men who have sex with men

METACOGNITIONS AND SEXUAL DYSFUNCTION

22

1
2
3 across 38 European countries. *Archives of Sexual Behavior*, 46, 1491-1502.

4
5 doi:10.1007/s10508-016-0819-y

6
7
8 **Pakpour, A. H., Yekaninejad, M. S., Nikoobakht, M. R., Burri, A., & Fridlund, B.**

9
10 (2014). Psychometric properties of the Iranian version of the premature ejaculation
11 diagnostic tool. *Sexual medicine*, 2, 31-40. doi:10.1002/sm2.21

12
13
14 **Papageorgiou, C., & Wells, A. (2001).** Positive beliefs about depressive rumination:

15 development and preliminary validation of a self-report scale. *Behavior Therapy*, 32,
16 13-26. doi:10.1016/S0005-7894(01)80041-1

17
18
19 **Papageorgiou, C., & Wells, A. (2003).** An empirical test of a clinical metacognitive model

20 of rumination and depression. *Cognitive Therapy and Research*, 27, 261-273.
21 doi:10.1023/A:1023962332399.

22
23
24 **Peixoto, M. M., & Nobre, P. (2015).** Prevalence of sexual problems and associated distress

25 among gay and heterosexual men. *Sexual and Relationship Therapy*, 30, 211-225.
26 doi:10.1080/14681994.2014.986084

27
28
29 **Porst, H., Montorsi, F., Rosen, R. C., Gaynor, L., Grupe, S., & Alexander, J. (2007).** The

30 Premature Ejaculation Prevalence and Attitudes (PEPA) survey: Prevalence,
31 comorbidities, and professional help-seeking. *European Urology*, 51(3), 816-824.
32 doi:10.1016/j.eururo.2006.07.004

33
34
35 **Quek, K. F., Sallam, A. A., Ng, C. H., & Chua, C. B. (2008).** Prevalence of sexual

36 problems and its association with social, psychological and physical factors among men
37 in a Malaysian population: A cross-sectional study. *Journal of Sexual Medicine*, 5, 70-
38 76. doi:10.1111/j.1743-6109.2006.00423.x

39
40
41 **Rajkumar, R.P., & Kumaran, A. K. (2015).** Depression and anxiety in men with sexual

42 dysfunction: A retrospective study. *Comprehensive Psychiatry*, 60, 114-118.
43 doi:10.1016/j.comppsy.2015.03.001

Ramos-Cejudo, J., Salguero, J.M., Kannis-Dymand, L., Garcia-Sancho, E., & Love, S.

(2017). Anger rumination in Australia and Spain: Validation of the Anger Rumination Scale. *Australian Journal of Psychology*, 65, 293-302. doi:10.1111/ajpy.12154

Serefoglu, E. C., McMahon, C. G., Waldinger, M. D., Althof, S. E., Shindel, A.,

Adaikan, G., . . . Torres, L. O. (2014) An evidence-based unified definition of lifelong and acquired premature ejaculation: report of the second international society for sexual medicine ad hoc committee for the definition of premature ejaculation. *Sexual Medicine*, 2, 41-59. doi:10.1002/sm2.27

Simpson, C., & Papageorgiou, C. (2003). Metacognitive beliefs about rumination in anger.

Cognitive Behavioural Practice, 10, 91-94. doi:10.1016/S1077-7229(03)80012-3

SMART (Sexual Minority Assessment Research Team). (2009). *Best practices for asking*

questions about sexual orientation on surveys. Retrieved from The Williams Institute website: <http://williamsinstitute.law.ucla.edu/wp-content/uploads/SMART-FINAL-Nov-2009.pdf>

Smith, A. M. A., Rissel, C. E., Richters, J., Grulich, A. E., & de Visser, R. O. (2003).

Sexual identity, sexual attraction and sexual experience among a representative sample of adults. *Australian and New Zealand Journal of Public Health*, 27, 138-145. doi:10.1111/j.1467-842X.2003.tb00801.x

Spada, M. M., Georgiou, G. A., & Wells, A. (2010). The relationship among

metacognitions, attentional control, and state anxiety. *Cognitive Behaviour Therapy*, 39, 64-71. doi:10.1080/16506070902991791

Spada, M. M., Zandvoort, M., & Wells, A. (2007). Metacognitions in problem

drinkers. *Cognitive Therapy and Research*, 31, 709-716. doi:10.1007/s10608-006-9066-1

Sugimori, H., Yoshida, K., Tanaka, T., Baba, K., Nishida, T., Nakazawa, R., &

Iwamoto, T. (2005). Relationships between erectile dysfunction, depression, and

1
2
3 anxiety in Japanese subjects. *Journal of Sexual Medicine*, 2, 390-396.

4
5 doi:10.1111/j.1743-6109.2005.20354.x

6
7
8 **Sun, X., Zhu, C., & So, S. H. W.** (2017). Dysfunctional metacognition across
9
10 psychopathologies: A meta-analytic review. *European Psychiatry*, 45, 139-153.

11
12 doi:http://dx.doi.org/10.1016/j.eurpsy.2017.05.029

13
14
15 **Symonds, T., Perelman, M., Althof, S., Giuliano, F., Martin, M., May, K., . . . Morris,**

16
17 **M.** (2007a). Development and validation of a premature ejaculation diagnostic tool.

18
19 *European Urology*, 52, 565-573. doi:10.1016/j.eururo.2007.01.028

20
21
22 **Symonds, T., Perelman, M., Althof, S., Giuliano, F., Martin, M., Abraham, L., . . . &**

23
24 **May, K.** (2007b). Further evidence of the reliability and validity of the premature

25
26 ejaculation diagnostic tool. *International Journal of Impotence Research*, 19, 521-525.

27
28 doi:10.1038/sj.ijir.3901567

29
30
31 **Tabachnik, B. G., & Fidell, L. S.** (2013). *Using multivariate statistics* (6th ed.) US: Pearson

32
33
34 **Twenge, J. M., Sherman, R. A., & Wells, B. E.** (2016). Changes in American adults'

35
36 reported same-sex sexual experiences and attitudes, 1973–2014. *Archives of Sexual*

37
38 *Behavior*, 45, 1713-1730. doi:10.1007/s10508-016-0769-4

39
40
41 **Vansintejan, J., Vandevoorde, J., & Devroey, D.** (2013). The gay men sex studies: Erectile

42
43 dysfunction among Belgian gay men. *International Journal of General Medicine*, 6,

44
45 527. doi:10.2147/IJGM.S45783

46
47
48 **Wells, A., Matthews, G.** (1994). *Attention and emotion: A clinical perspective*. Hove (UK):

49
50 Lawrence Erlbaum.

51
52
53 **Wells, A., & Matthews, G.** (1996). Modelling cognition in emotional disorder: The S-REF

54
55 model. *Behaviour Research and Therapy*, 34, 881–888. doi:10.1016/S0005-7967

56
57 (96)00050-2

- 1
2
3 **Wells, A.** (2000). *Emotional disorders and metacognition: Innovative cognitive therapy*.
4
5 Chichester, England: Wiley.
6
7
8 **Wells, A.** (2009). *Metacognitive therapy for anxiety and depression*. New York, NY:
9
10 Guildford Press
11
12 **Wells, A.** (2011). Metacognitive therapy. In Herbert, J. D. & Forman, E. M. (Eds.),
13
14 *Acceptance and mindfulness in cognitive behavior therapy: Understanding and*
15
16 *applying the new therapies* (pp. 83-108). Hoboken, New Jersey: John Wiley & Sons.
17
18
19 **Wells, A.** (2013). Advances in metacognitive therapy. *International Journal of Cognitive*
20
21 *Therapy*, 6(2), 186-201. doi:10.1521/ijct.2013.6.2.186
22
23
24 **Wells, A., & Cartwright-Hatton, S.** (2004). A short form of the metacognitions
25
26 questionnaire: Properties of the MCQ-30. *Behaviour Research and Therapy*, 42, 385–
27
28 396. doi:10.1016/S0005-7967(03)00147-5
29
30
31 **Wilson VanVoorhis, C. R., & Morgan, B.L.** (2007). Understanding power and rules of
32
33 thumb for determining sample sizes. *Tutorials in Quantitative Methods for Psychology*,
34
35 3, 43-50. doi:10.20982/tqmp03.2.p043
36
37
38 **Yılmaz, A. E., Gençöz, T., & Wells, A.** (2011). The temporal precedence of metacognition
39
40 in the development of anxiety and depression symptoms in the context of life-stress: A
41
42 prospective study. *Journal of Anxiety Disorders*, 25, 389-396.
43
44 doi:10.1016/j.janxdis.2010.11.001
45
46
47 **Zarbo, C., Brugnera, A., Compare, A., Secomandi, R., Candeloro, I., Malandrino, C., ...**
48
49 **& Frigerio, L.** (2019). Negative metacognitive beliefs predict sexual distress over and
50
51 above pain in women with endometriosis. *Archives of women's mental health*, 22, 575-
52
53 582. doi.org/10.1007/s00737-018-0928-9
54
55
56
57
58
59
60

Table 1

Sexual Orientation and Sexual Dysfunction

Sexual dysfunction	Sexual orientation			
	Heterosexual (%) ^a	Bisexual (%) ^a	Homosexual (%) ^a	Total (%) ^a
HC ^b	87 (37%)	69 (29%)	80 (34%)	236 (100%)
ED only	29 (20%)	41 (28%)	77 (52%)	147 (100%)
PE only	34 (52%)	14 (22%)	17 (26%)	65 (100%)
ED and PE	38 (46%)	20 (24%)	25 (30%)	83 (100%)
Total	188 (35%)	144 (27%)	199 (38%)	531 (100%)

^a Percentage of Total Sexual Dysfunction^b Healthy Controls.

Table 2

Demographic Characteristics as Percentages

Characteristics	Percentage ^a
Ethnicity	
White/Caucasian	87.6
Asian	1.9
Hispanic/Latino	3.0
Indian	0.8
Black/African-American	1.1
African	1.7
Other (e.g., Middle Eastern)	3.9
Education	
Postgraduate Degree	16.7
University/College Degree	40.7
Tertiary Certificate or Diploma	19.4
Completed Year 12	17.5
Completed Year 10	3.8
Less than Year 10	1.9
Current University/College Students – part-time/fulltime	5.9/15.0

Note. ^a*n* = 474 (i.e., completed relevant question)

Table 3

Mean (M) and Standard Deviation (SD), Sexual Orientation, MCQ-30 Subscale, and Sexual Dysfunction

Sexual dysfunction	Sexual orientation							
	Heterosexual		Bisexual		Homosexual		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	Cognitive confidence							
HC ^a	10.31	3.86	11.00	4.58	9.70	3.62	10.31	4.02
ED only	10.31	2.80	11.73	4.04	10.74	3.82	10.93	3.72
PE only	11.62	4.19	13.00	3.64	10.71	4.21	11.68	4.10
PE and ED	12.97	4.51	13.30	4.37	13.04	4.49	13.07	4.42
	Positive beliefs							
HC ^a	10.02	3.50	10.26	4.17	9.50	3.89	9.92	3.84
ED only	9.86	4.54	10.49	3.99	10.79	4.34	10.52	4.27
PE only	9.27	3.50	9.43	2.79	11.06	4.83	9.77	3.79
PE and ED	9.95	4.09	10.60	3.98	11.60	4.07	10.60	4.07
	Cognitive self-consciousness							
HC ^a	16.02	4.18	16.78	5.20	16.70	4.44	16.47	4.58
ED only	15.34	5.09	16.54	4.07	16.01	3.37	16.03	3.95
PE only	15.91	3.77	15.07	4.84	16.18	4.52	15.80	4.17
PE and ED	15.68	4.31	16.25	2.84	16.40	3.84	16.04	3.83
	Thoughts concerning uncontrollability and danger							
HC ^a	11.53	4.44	12.70	5.42	11.45	4.91	11.84	4.91
ED only	13.24	5.59	12.98	4.90	13.18	4.91	13.14	5.01

1									
2									
3	PE only	11.50	4.02	13.93	6.09	14.76	5.02	12.88	4.94
4									
5	PE and ED	14.44	5.43	14.55	3.61	16.12	4.76	14.98	4.85
6									
7									
8		Negative beliefs - need to control thoughts							
9									
10	HC ^a	11.43	3.78	11.75	4.38	9.94	3.78	11.02	4.03
11									
12	ED only	12.03	4.60	11.37	5.03	11.12	3.60	11.37	4.23
13									
14	PE only	11.79	3.37	12.57	5.61	11.71	4.97	11.94	4.31
15									
16	PE and ED	13.11	4.65	13.15	3.67	11.88	4.33	12.75	4.32
17									
18									

^a Healthy Controls.

For Peer Review

Table 4

Mean Difference Between Sexual Dysfunction Groups and Significance Level for the MCQ-30 Subscale and 95% Confidence Interval for the Mean Difference

		Mean difference	Std Error	Sig ^b	95% CI for mean difference ^b	
					Lower bound	Upper bound
Cognitive confidence						
HC ^c	ED only	-.73	.45	.106	-1.62	.16
HC ^c	PE only	-1.3*	.60	.027	-2.50	-.15
HC ^c	PE + ED	-2.8*	.53	<.001	-3.88	-1.81
ED only	PE only	-.60	.66	.365	-1.89	.70
ED only	PE + ED	-2.11*	.58	<.001	-3.25	-.97
PE only	PE + ED	-1.51*	.71	.033	-2.91	-.12
Positive beliefs						
HC ^c	ED only	-.64	.45	.154	-1.52	.24
HC ^c	PE only	.16	.59	.788	-1.01	1.33
HC ^c	PE + ED	-.89	.52	.091	-1.92	.14
ED only	PE only	.80	.66	.222	-.49	2.09
ED only	PE + ED	-.25	.58	.670	-1.38	.89
PE only	PE + ED	-1.05	.71	.138	-2.43	.34
Cognitive self-consciousness						
HC ^c	ED only	.36	.48	.449	-.58	1.30
HC ^c	PE only	.92	.64	.148	-.33	2.17
HC ^c	PE + ED	.30	.56	.594	-.80	1.40

ED only	PE only	.56	.70	.426	-.82	1.93
ED only	PE + ED	-.06	.62	.917	-1.28	1.15
PE only	PE + ED	-.62	.75	.410	-2.10	.86
Thoughts concerning uncontrollability and danger						
HC ^c	ED only	-1.76*	.54	.001	-2.83	-.70
HC ^c	PE only	-1.09	.72	.128	-2.50	.32
HC ^c	PE + ED	-3.42*	.63	<.001	-4.66	-2.18
ED only	PE only	.67	.79	.397	-.88	2.22
ED only	PE + ED	-1.66*	.70	.017	-3.03	-.29
PE only	PE + ED	-2.33*	.85	.006	-4.00	-.66
Negative beliefs - need to control thoughts						
HC ^c	ED only	-.88	.46	.054	-1.78	.02
HC ^c	PE only	-.65	.61	.281	-1.85	.54
HC ^c	PE + ED	-1.89*	.53	<.001	-2.94	-.84
ED only	PE only	.23	.67	.732	-1.08	1.54
ED only	PE + ED	-1.01	.59	.087	-2.17	.15
PE only	PE + ED	-1.24	.72	.086	-2.65	.18

*The mean difference is significant at the .05 level.

^b Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

^c Healthy Controls.

Table 5

Mean (M) of Sexual Orientation for MCQ-30 Subscale and Sexual Dysfunction

Sexual orientation	Mean	Std error	95% CI for mean difference	
			Lower bound	Upper bound
Cognitive confidence				
Heterosexual	11.22 ^a	.32	10.59	11.86
Bisexual	12.20 ^a	.40	11.43	13.01
Homosexual	11.12 ^a	.36	10.42	11.82
Positive beliefs				
Heterosexual	9.67 ^a	.32	9.04	10.30
Bisexual	10.14 ^a	.40	9.36	10.93
Homosexual	10.84 ^a	.35	10.15	11.54
Cognitive self-consciousness				
Heterosexual	15.65 ^a	.34	14.97	16.32
Bisexual	16.11 ^a	.43	15.28	16.95
Homosexual	16.42 ^a	.38	15.68	17.16
Negative beliefs - uncontrollability and danger				
Heterosexual	12.39 ^a	.39	11.63	13.15
Bisexual	13.40 ^a	.48	12.45	14.34
Homosexual	14.16 ^a	.43	13.33	15.00
Negative beliefs - need to control thoughts				
Heterosexual	11.86 ^a	.33	11.22	12.50
Bisexual	12.10 ^a	.41	11.30	12.90
Homosexual	11.39 ^a	.36	10.68	12.10

^aCovariates appearing in the model are evaluated at the following values: What is current your age in years? = 42.63.

Table 6

Mean Difference Between Sexual Orientation and Significance Level for the MCQ -30

Subscale and 95% Confidence Interval for the Mean Difference

Sexual orientations		Mean difference	Std error	Sig ^b	95% CI for difference ^b	
					Lower bound	Upper bound
Cognitive confidence						
Heterosexual	Bisexual	-.99	.51	.053	-2.00	.01
Heterosexual	Homosexual	.10	.49	.831	-.85	1.06
Bisexual	Homosexual	1.10*	.50	.042	.04	2.16
Positive beliefs						
Heterosexual	Bisexual	-.47	.51	.354	-1.5	.53
Heterosexual	Homosexual	-1.17*	.48	.015	-2.12	-.22
Bisexual	Homosexual	-.70	.54	.193	-1.75	.35
Cognitive self-consciousness						
Heterosexual	Bisexual	-.47	.55	.391	-1.54	.60
Heterosexual	Homosexual	-.77	.52	.134	-1.78	.24
Bisexual	Homosexual	-.31	.57	.594	-1.43	.82
Thoughts concerning uncontrollability and danger						
Heterosexual	Bisexual	-1.00	.62	.103	-2.21	.20
Heterosexual	Homosexual	-1.77*	.58	.002	-2.91	-.63
Bisexual	Homosexual	-.77	.65	.235	-2.04	.50
Negative beliefs - need to control thoughts						
Heterosexual	Bisexual	-.24	.52	.649	-1.26	.79
Heterosexual	Homosexual	.47	.49	.337	-.49	1.44

1
2
3 Bisexual Homosexual .71 .55 .194 -.36 1.78
4

5 Based on estimated marginal means
6

7 *. The mean difference is significant at the .05 level.
8

9 b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review