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# A systematic review examining alcohol dependence and sexual dysfunction across genders

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## Abstract

This systematic review examines the impact of alcohol dependence on sexual function amongst cisgender men and women, intersex, transgender, and gender-nonconforming individuals. Electronic searches using PubMed, PsycInfo, Web of Science, and registered clinical trials, yielded 22 relevant studies. Research looking at alcohol dependence and sexual dysfunction in cisgender women, and even more so intersex, transgender and gender non-conforming people has received comparatively less attention than for cisgender men, with a 1:5 ratio. Consensus of the included literature indicated that alcohol dependence does impact sexual functioning, which includes erectile dysfunction and premature ejaculation for cisgender men and sexual desire and orgasmic difficulties for cisgender women. With an overall general shortage of research on alcohol dependence and sexual dys/function, psychosexual services remain limited when supporting dual-diagnosed and sex and gender diverse groups.

**Keywords:** Alcohol dependence; Sexual dysfunction; Men; Women; Cisgender

## 1. Introduction

Alcohol dependence is a multi-dimensional disorder that affects biopsychosocial functioning (Dissiz et al., 2015). According to the DSM-5, it is characterised by an inability to control the amount of alcohol consumed. The level of alcohol consumption increases over time to obtain the desired effect as tolerance and dependence develops. Despite having health-related problems, those with alcohol use disorders continue to consume alcohol, often affecting work and family relationships (American Psychiatric Association., APA, 2013). In the UK, it has been estimated that there are approximately 602391 dependent drinkers of which 18% are receiving treatment (ONS., 2021). Alcohol dependence is associated with cancer, depression, dementia, liver failure, and sexual dysfunction (NHS., 2021).

Sexual dysfunctions are a group of disorders marked by clinical disturbances in the engagement and experience of sexually satisfying behaviours (APA, 2013). Examples include female orgasmic disorder, female/male sexual interest/arousal disorder, genito-pelvic pain/penetration disorder, premature ejaculation, delayed ejaculation, erectile disorder, or substance/medication-induced sexual dysfunction (APA, 2013).

Short-term alcohol intoxication is known to increase sexual desire and to inhibit sexual performance (Cheng et al., 2007). Alcohol is a central nervous system depressant and has been associated with hypogonadism and feminization in men and loss of gonadal function with resultant defeminization in women (Van Thiel et al., 1980). Indeed, an associated hypothalamic-pituitary defect in gonadotropin secretion inhibits gonadotropin secretion in response to the primary gonadal injury induced by alcohol dependence (Van Thiel et al., 1980). This may impact hormonal levels and blood flow to the gonads which, consequently, affect sexual functioning (Van Thiel et al., 1980).

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A cross-cultural study of alcohol and sexual behaviour across eight countries reported that 12% of the population consume alcohol prior to sexual intercourse due to performance anxiety and perceived improved sexual pleasure (Laumann et al., 1999). Crowe and George (1998) examined binary gender differences between cisgender men and women and the disinhibiting effects of alcohol on sexual behaviour. Their findings suggested that societal restrictions on cisgender women displaying sexual pleasure are reduced with alcohol disinhibition, when compared to cisgender men. However, for alcohol dependent women, the psychosexual responses may increase because of alcohol-induced reduction of the inhibitory conflict (e.g. Steele and Josephs 1990). Some men and women report having experienced sexual dysfunction prior to becoming alcohol dependent (e.g., Norris., 1994). Arguably, a bidirectional relationship may exacerbate and maintain sexual dysfunction which, in turn, could perpetuate further alcohol consumption (e.g., Ventus and Jern., 2016).

Among cisgender men with alcohol dependence, commonly reported sexual dysfunction include erectile dysfunction (ED), premature ejaculation (PE), delayed ejaculation (DE), and decreased sexual desire (DSD) (e.g. Okulate et al., 2003; Grinshpoon et al., 2007; Dişsiz and Oskay., 2011; Chao et al., 2015; Ponizovsky et al., 2008; Guay et al., 2010; Grigorenko and Perfil'eva., 2013; Ventus and Jern., 2016; Pendharker et al., 2016; Mandal, et al., 2021). Among cisgender women with alcohol dependence, dyspareunia and vaginal dryness have been reported (e.g. Kumar et al., 2017; Dişsiz, Beji, and Oskay., 2015). Clinic-based research has emphasized the importance of assessing sexual functioning among those with alcohol use disorders so that other factors associated with sexual dysfunction can be ruled out.

Overall, research in this area has associated alcohol dependence with sexual dysfunction predominately among men (e.g. Bhansora et al., 2021; Rohilla et al., 2020, Prabhakaran et al., 2018; Pendharker et al., 2017; Arackal and Benegal., 2007). Indeed, research looking at women's sexuality and alcohol dependence has historically received little attention (e.g., Kumar et al., 2017). However, recent research is beginning to look at cisgender women's drinking patterns and sexual functioning, particularly among menopausal women (e.g., Jenczura et al., 2018); although current understanding of these issues is somewhat fuzzy.

This systematic review therefore aimed to provide a timely and current evaluation of sexual dysfunction among cisgender men and women. Further, it aimed to identify where research gaps exist and possible implications for psychosexual healthcare services. Sexual risk behaviours and sexual abuse have been excluded from this review as these warrant a systematic investigation in their own right.

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## 2. Methods

A systematic review of the available published literature that has examined primary studies on alcohol dependence and sexual dys/function amongst different genders. A set of inclusion and exclusion criteria were applied to the research to minimise heterogeneity. Primary studies were based on the inclusion and exclusion criteria outlined below:

### 2.1 Inclusion criteria

- Peer-reviewed published journals
- Quantitative research
- Date limit set on articles 2000-2022

### 2.2 Exclusion criteria

- Non-peer-reviewed articles (e.g., books, artefacts, conference reports)
- Qualitative research
- Meta-analysis
- Non-human studies
- Studies or books that went beyond alcohol dependence and sexual function/dysfunction
- Articles that did not include alcohol dependence and sexual function/dysfunction in the title

### 2.3 Search strategy

A systematic search based on alcohol dependence and sexual dysfunction was conducted in January 2022. PubMed, PsycINFO, Web of Science, and Cochrane Library advanced search were accessed to capture a range of research studies and books related to alcohol dependence and sexual dysfunction in cisgender men and women and intersex,

transgender, and gender non-conforming clients. This was proceeded with Boolean operations between 2001 to 2022 and included the following search terms:

- 1. (“alcohol dependence” OR “alcohol use disorder” OR “alcoholic”) AND (“sexual function” OR sexual dysfunction”) AND (“men” OR “male” OR “man” OR “women” OR “female” OR “woman” OR “cisgender woman” OR “cisgender man” OR “trans” OR “transgender” OR “gender-diverse” OR “TGD” OR “transmen” OR “transwomen” OR “transman” OR “transwoman” OR “intersex”) OR “couples” OR “individuals”.

This stage proceeded with variations of individualised sexual dysfunctions

- 2. 1# AND (“female orgasmic disorder” OR “female sexual interest/arousal disorder” OR “genito-pelvic pain/penetration disorder” OR “premature ejaculation” OR “delayed ejaculation” OR “erectile disorder” OR “male sexual interest/arousal disorder” OR “erectile dysfunction” OR “sexual pain” OR “vulvodynia” OR “sex” OR “sexual desire” OR “fertility”)
- 3. 1 and 2# AND (“sex therapy”, OR “psychosexual therapy” OR “couple counselling” OR “couple therapy” OR “relationship therapy”)

This review conformed to recommendations from the Preferred Reporting Items for Systematic Reviews (PRISMA) statement (Moher, Liberati, Tetzlaff, and Altman, 2009). Duplicate articles were removed from the search along with a review of the titles, abstracts, and suitable full texts were included based on the inclusion and exclusion criteria. A quality evaluation of the studies was made via Cochrane RevMan 5.4 which considers the design, sample, and quality of the assessments used (RevMan 5., 2020).

## 2.4 Article selection

As illustrated in Figure 1., PubMed Database Searches based on search terms 1-3 produced 710 studies. Following a filtering analysis based on the inclusion and exclusion criteria, 18 eligible studies remained. PsycINFO Database Searches based on terms 1-3 yielded 21 studies. Following a filtering analysis based on the inclusion and exclusion criteria, 1 study remained eligible. Web of Science Database Searches yielded 162 studies. Following a filtering analysis based on the inclusion and exclusion criteria, 1 study was identified as eligible. Cochrane database searches yielded 0 additional studies. In total, 20 studies were eligible for inclusion in this review.

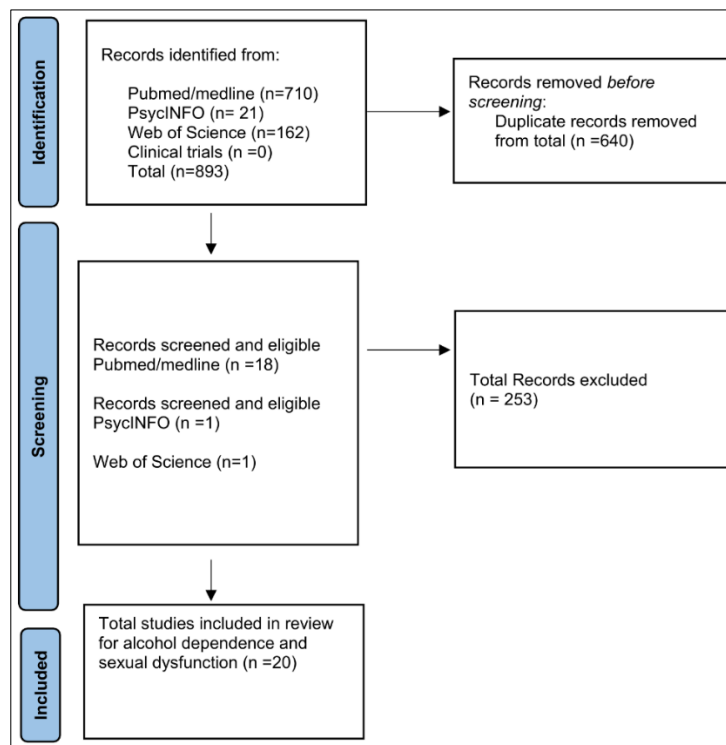


Figure 1 PRISMA flow diagram

### 3. Results

As shown in Table 1., of the 20 eligible studies, there were higher numbers of men than women included in the studies. Fewer studies had combined cisgender male and female participants for comparative analysis. However, when looking at partnerships (heterosexual relationships only) a proportion of the literature had targeted the impact of alcohol dependence on sexual function and relationship satisfaction. Studies only included non-cisgender individuals, resulting in intersex, trans, and gender non-conforming individuals being invisible groups in this systematic review.

With reference to studies that included cisgender men, a wide cultural range was evident with data from Nigeria, Israel, Turkey, Taiwan, Russia, Finland, and India (Okulate et al., 2003; Grinshpoon et al., 2007; Dişsiz and Oskay., 2011; Chao et al., 2015; Poizovsky et al., 2008; Grigorenko and Perfil'eva., 2013; Ventus and Jern., 2016; Pendharkar et al., 2016; Mandal, et al., 2021). Studies consisted of single groups and case-controlled studies, which included experimental and control groups. Sample sizes ranged between 40 to 1000 participants with ages ranging from 18 to 60 years. The majority of research had comparable alcohol dependence group and control group numbers; however, two studies had significant disparity between them (Okulate et al., 2003; Pendharkar et al., 2016). Gold standard assessment tools were used throughout and included the International Index of Erectile Function (IIEF) (Rosen, Cappelleri, and Gendrano., 2002); Cronbach's alpha, range=0.73–0.99); Arizona Sexual Experience Questionnaire (ASEX) (McGahuey et al., 2000; Cronbach's alpha = .906); Quality of Life Enjoyment and Satisfaction Questionnaire (Stevanovic., 2011; Cronbach's alpha = .900); General Health Questionnaire (Goldberg and Hillier., 1979; Cronbach's alpha = >.700); and Rosenberg's General Self-Esteem Scale (RGSES) (Rosenberg., 1965; Chronbach alpha = .860). Most of the studies suggested that alcohol is directly associated with sexual dysfunction including erectile dysfunction, premature ejaculation, and decreased sexual satisfaction. However, one study in Nigeria found that alcohol dependence did not predict erectile dysfunction (Okulate et al., 2003).

With reference to studies that included cisgender females, there was a wide geo-cultural range of research available from Scotland, Turkey, India, and Poland (Costa, and Brody., 2010; Jenczura et al., 2018; Amil Kumar et al., 2017; Dişsiz, Beji, and Oskay., 2015). These studies focused on the relationship between alcohol dependence and sexual function which further included the role that menopause plays in sexual functioning (Jenczura et al., 2018). The majority of this research was cross-sectional and longitudinal. The studies tended to be single groups and case-control studies, in which comparisons were made with control groups. Sample sizes ranged from 40 to 233 experimental groups and 40 to 92 control groups. Most of this research had comparable group sizes, but one study showed significant disparity (Dişsiz, Beji, Oskay., 2014). The age of the study samples predominantly ranged from 40 to 60 years. It is difficult to determine whether this was early- or late-onset alcohol dependence. Gold standard assessment tools were used which included Sexual Dysfunction Checklist (SDC) (Otero et al., 2018, Cronbach alpha = .800); Arizona Sexual Experience Questionnaire (ASEX) (McGahuey et al., 2000; Cronbach's alpha = .906); Female Sexual Function Index—FSFI (Rosen et al., 2000; Cronbach alpha= >.820); Menopause Rating Scale—MRS (Heinemann et al., 2004; Cronbach alpha= >.800); the Michigan Alcoholism Screening Test—MAST (Selzer 1975; Cronbach alpha= .890); and Female Sexual Distress Scale (FSDS) (Derogatis et al 2008; Cronbach alpha = ≥ 0.91).

All outcomes suggested that alcohol impacted sexual functioning which included sexual desire, arousal, and orgasm quality. Therefore, the control groups experienced higher levels of sexual satisfaction and lower levels of sexual dysfunction when compared to the non-control group (alcohol dependence). Menopausal symptoms increased with excessive alcohol use. Predictors of sexual dysfunction included a longer duration and higher amount of alcohol consumed.

With reference to couples and gender comparison studies, limited available research had targeted this. Studies predominated in India and the US (Dunlop et al., 2020; Rodriguez et al., 2013; Kelly et al., 2002; McAweeney et al., 2005; Hone et al., 2013; Rohilla et al., 2020; Bhainsora et al., 2021). Overall, research centred on the cost-effectiveness and efficacy of group and individual therapy (Dunlop et al., 2020) and the impact alcohol had on relationship satisfaction and intimacy (Rodriguez et al., 2013; Kelly et al., 2002, McAweeney et al., 2005; Rohilla et al., 2020; Bhainsora et al., 2021). Outcomes were vague with regard to the role that alcohol played in perception of relationship quality, the impact this had on sexual functioning, and whether this included relational dissatisfaction.

Research has suggested that if alcohol dependency is treated then relationship satisfaction improves. However, one study suggested that whether the marital partner was intoxicated or in rehabilitation, relationship satisfaction was low in the non-drinking spouse (Rodriguez et al., 2013). Information on the perception of the relationship among those with alcohol dependence was limited. However, one study compared dependent women with non-dependent controls (Kelly et al., 2002). The control group rejected expectations of enhanced relationship functioning (such as sexual intimacy) following alcohol consumption. However, the experimental group reported lower relational efficacy. Another study

compared drinking and sexual behaviours among college students (Hone et al., 2013). It was determined that men partook in drinking games more frequently and consumed higher levels of alcohol than women. This relationship was partially mediated by sexual and competitive motivations.

Studies tended to be single groups and case-control studies, in which comparisons were made with non-dependent controls. Sample sizes ranged from 70 to 687 participants with disproportionate male to female numbers. Gold standard assessment tools used included Alcohol Dependence Questionnaire (SADQ) (Stockwell et al., 1983; Cronbach alpha= .82 to .87); Marital Adjustment Test (MAT) (Locke and Wallis., 1959; Cronbach alpha= 0.69 for husbands and 0.72 for wives); and Arizona Sexual Experience Scale (ASEX) (McGahuey et al., 2000; Cronbach's alpha = .906). All studies used cisgender, heterosexual, married couples, with limited cultural or ethnic inclusion or gender or sexual diversity.

**Table 1** Summary of studies included in this review

Author/Year	Country	Study Design	Sample	Outcomes
Chao et al., 2015	Taiwan	Cross-sectional study including obesity, diabetes, hypertension and testosterone levels. Demographic assessment – The Chinese CAGE (C-CAGE), International Index of Erectile Dysfunction (IIEF), Blood-testosterone	192 Aborigines with Alcohol Use Disorder (AUD). Aged 35-75 yrs.	ED is highly prevalent among Aborigines with risk factors of old age, alcohol abuse and abnormal testosterone levels. Research should focus on Taiwanese Aborigines to establish a better understanding of how these risk factors impact this group.
Dişsiz and Oskay., 2011	Turkey	Descriptive study looking at sexual dysfunction of AUD. Demographic assessment and IIEF-15	233 men. Age 41 years old. 58% unemployed. 70%-mild ED 4%-moderate ED	AUD affects sexual functioning. SD was related to education, unemployment, age of alcohol consumption and duration of smoking.
Grigorenko and Perfil'eva., 2013	Russia	Longitudinal Biological analysis	70 long-term alcohol users	Physical changes took place in the testes due to sclerotic stromal and functional parenchymal atrophy
Grinshpoon et al., 2007	Israel	Open-label trial Sildenafil – 50mg IIEF-15 Quality of life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) General Health Questionnaire (GHQ)	54 men with AUD 85% ED 70% low libido 61% PME 25% orgasmic problems 6% sexual pain	Sildenafil had a positive impact on sexual functioning. Overall quality of life improved with a reduction in emotional distress.
Mandal, et al., 2021	India	Cross sectional study Arizona sexual experiences (ASEX) New sexual satisfaction scale (NSS) WHO-Quality of Life (WHOQOL)-BREF	50 AUD and 50 non-AUD	Sexual dysfunction was commonly seen among men with AUD vs, non-AUD. This included sexual desire, satisfaction, orgasm and quality of life. Authors recommend motivational interviewing.
Okulate et al., 2003	Nigeria	Descriptive study IIEF	829 Nigerian men in active service of the	Among those with ED, 58and were aged 51 – 60 years. 10% were depressed and had AUD.

		PHQ-9	Nigerian army. 329 with ED out of 829 participants	1% panic disorder. Whilst age and depression were good predictors of ED, AUD and Panic disorder were not.
Pendharkar et al., 2016	India	Case-control observational. Arizona Sexual Experience Scale (ASEX) Dyadic Adjustment Scale (DAS) Hamilton Depression Rating Scale (HDRS) State-Trait Anxiety Inventory (STAI) Severity of Alcohol Dependence Questionnaire (SADQ) Clinical institute withdrawal assessment for alcohol scale (CIWA-Ar)	101 ASUD and 50 controls – non-AUD	58% of those with AUD had sexual dysfunction. 57% reported arousal difficulties, 55% desires, 37% erectile problems and 13% reported orgasmic problems. Outcomes for SD were higher in the AUD than the control group.
Ponizovsky et al., 2008	Israel	Within an open-label sildenafil trial. Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) IEEF BDI-13 GHQ-12 Rosenberg's General Self-Esteem Scale (RGSES) Multidimensional Scale of Perceived Social Support (MSPSS)	101 men aged 18-50 years with AUD	There was a relationship between ED and the quality of life mediated by depression, self-esteem and emotional distress.
Ventus and Jern., 2016	Finland	Correlational design IEEF-5 Alcohol Use Disorders Identification Test Godin Leisure-Time Exercise Questionnaire	863 men Population-based sample	There was a positive relationship between premature ejaculation and physical exercise. This remained significant after controlling for alcohol use.
il Kumar et al., reported 2017	India	Cross-sectional case-control study Mini International Neuropsychiatric Interview (MINI) ASEX Sexual Dysfunction Checklist SADQ	40 women with AUD and 40 control non-AUD. Aged 18-50 years	Higher levels of SD were among the AUD group. Among AUD's, SD's consisted of sexual desire (55%), difficulty reaching orgasm (53%) and dissatisfaction with orgasm (50%). Predictors of SD included lower educational achievement and longer duration and higher levels of alcohol dependence.

Costa, and Brody., 2010	Scotland	Correlational design Defence Style Questionnaire (DSQ-40)	233 women – focus on alcohol consumed before sex (ACBS)	ACBS was associated with less orgasm but positively correlated with clitoral stimulation during penile penetration
Dişsiz, Beji, and Oskay., 2015	Turkey	Cross-sectional case- control study. WHO Quality of Life Scale Brief Form (WHOQOL- BREF TR) Female Sexual Function Index (FSFI) Beck's Depression Inventory (BDI)	71 women with AUD ad 183 women non- AUD	Higher levels of sexual problems were reported among the AUD group along with higher levels of depression and lower levels of life satisfaction.
Jenczura et al.,2018	Poland	Cross-sectional case- control study. Female Sexual Function Index (FSFI) Menopause Rating Scale (MRS) Michigan Alcoholism Screening Test (MAST)	97 menopausal women with AUD aged between 40-60 yrs and 92 non- AUD menopausal women	AUD is a risk factor for the course of perimenopause and menopause resulting in symptom escalation. Among AUD's levels of sexual dysfunction were higher.
Bhainsora et al., 2021	India	Cross-sectional study SADQ ASEX	100 married men with AUD aged 18+ years	48% had sexual dysfunction with 88% reporting reduced sexual desire, 79and with arousal difficulties, 58% with ED. 54% with problems achieving orgasm. There was a positive relationship between AUD and sexual function, which was dose and duration dependent.
Dunlop et al., 2020	USA	Therapy intervention study. Cost evaluation and effectiveness between couples therapy and individual session or group behavioural therapy. Percentage days abstinent (PDA) from the Timeline Followback (TLFB) interview The inventory of Drug Use Consequences (InDUC) Patient-reported Dyadic Adjustment Scale (DAS) Partner-reported DAS score	101 patients with AUD and their intimate partners	Following the initial sessions plus 12-month follow-up. Group couple therapy was cheaper than couples and individual therapy was more effective.
Hone et al., 2013	USA	Cross-sectional study AUDIT	College drinking students.	Men consumed more alcohol than women. This was mediated by higher levels of mating effort, competitiveness and sexual



		Sociosexual Orientation Inventory (SOI) Cooperative/Competitive Strategy Scale	351 female students with 336 male students aged between 17-26 years.	motivations among men than women. Binge drinking is a major risk factor for students' health problems.
Kelly et al., 2002	Australia	Cross-sectional case-control study. SADQ Dyadic Adjustment Scale (DAS) The Relational Efficacy Questionnaire (REQ) The KAT Canterbury Alcohol Screening Test (CAST)	174 married women. Alcohol and relationship problems (n=20). Alcohol problems (n=26). Relationship problems (n=30) No relationship or alcohol problems (n=98)	Those without problem drinking or relationships rejected having relationship expectations following alcohol consumption. Women with alcohol and relationship difficulties reported lower relationship efficacy and were ambivalent to relationship expectations.
McAweeney et al., 2005	USA	Longitudinal study Formal AUD diagnosis# DSM-IV pre- and post-9-year follow-up	134 coupled men with AUD. Partners were also assessed for AUD	Interpersonal factors can perpetuate or support alcohol abstinence. Partner characteristics were key in AUD or non-AUD outcomes
Rodriguez et al., 2013	USA	Cross-sectional design. Daily Drinking Questionnaire (DDQ) The Quality/Frequency/Peak alcohol Use Index Modified Version of the Rutgers Alcohol Problems Index (RAPI) The quality of Marriage Index (QMI) The investment Model Scale (IMS) Perception of Partner's problematic alcohol use.	Those in committed relationship dyads (n=78)	When partners drank at higher levels their drinking was not viewed as problematic where overall relationship dissatisfaction was reported. Partners' perceptions of lower alcohol use were negatively associated with relationship satisfaction. Thus, heavy drinkers were not a perception but lower drinkers about relationship satisfaction.
Rohilla et al., 2020	India	Cross-sectional descriptive study Revised Withdrawal Assessment of Alcohol Scale SADQ Marital Adjustment test (MAT) ASEX	70 AUD men# 70 non-AUD men all partnered/married	Among those with AUD- 59% reported sexual dysfunction compared to 19% of controls. 70% of AUDs had ED, and 63% had arousal difficulties. There was a negative correlation between MAT and SAD-Q. However, there was not a significant outcome between alcohol duration and marital satisfaction.

#### 4. Discussion

This review aimed to elucidate the extent of the literature on alcohol dependence and sexual functioning across genders. It was observed that little research has been conducted on alcohol dependence and sexual functioning among cis men and women; and there are small-zero studies to explore these factors across other genders. Among the studies included in this review, sexual dysfunction was commonly reported among those with alcohol dependence. According to Grover et al., (2014), this often leads to treatment nonadherence as well as sexual and marital difficulties.

For cisgender men, this included erectile dysfunction, premature ejaculation, loss of sexual desire, and decreased sexual satisfaction (Okulate et al., 2003; Grinshpoon et al., 2007; Dişsiz and Oskay., 2011; Chao et al., 2015; Ponizovsky et al., 2008; Guay et al., 2010; Grigorenko and Perfil'eva., 2013; Ventus and Jern., 2016; Pendharkar et al., 2016; Mandal, et al., 2021). These findings have been reflected in similar research. For example, a meta-analysis looking at the relationship between alcohol consumption and erectile dysfunction among 46 cisgender men (n=216,461 participants) found a significant association between regular alcohol consumption and ED (OR 0.89, 95% confidence interval [CI]: 0.81–0.97) (Li et al., 2021). A sub-group analysis suggested that alcohol dependence was linked with vascular damage and compromised blood flow to the penis. However, not all research has found an association between alcohol dependence and sexual dysfunction (Okulate et al., 2003).

Though inconclusive, research has identified a bidirectional relationship between alcohol dependence and sexual dysfunction. Higher levels of alcohol consumption might lead to sexual dysfunction (or vice versa) and sexual dysfunction might perpetuate alcohol use (or vice versa). According to Sarkar et al (2021) higher levels of alcohol increase the severity of sexual dysfunction, suggesting a dose-response relationship. Physiological risk factors include age, obesity, diabetes mellitus, hypertension, and testosterone. Psychosocial risk factors include unemployment, starting alcohol consumption at an early age, long-term cigarette smoking, and self-esteem issues. During alcohol intoxication, reports of ED appeared higher compared to other sexual dysfunctions and during alcohol withdrawal, premature ejaculation was more commonly reported (e.g., Ventus and Jern., 2016). In the UK, stress has been strongly associated with alcohol dependence for both cisgender women and men but plays an especially critical role for women (Peltier et al., 2019).

For cisgender women, dominant issues were sexual desire issues and orgasmic problems (e.g., Kumar et al., 2017). Additional difficulties included sexual pain, vaginal dryness and lack of arousal. These findings appear to be consistent among alcohol dependent cisgender women (Grover et al., 2014). The study in India predominately yielded clinical presentations orgasmic and sexual desire issues (Kumar et al., 2017) and a study conducted in Turkey included dyspareunia and lubrication problems (Dişsiz, et al., 2015). More cultural research is necessary to identify whether certain sexual dysfunctions are culturally specific and/or are alcohol-dose dependent. Among pre-menopausal and menopausal women, the use of alcohol appears to exacerbate menopausal symptoms (Lonnée-Hoffmann et al., 2014; Jenczura et al., 2018). Reduction in testosterone and estrogen have been associated with reduced sexual desire, lubrication, orgasm, and pain (Tizobek et al., 2017).

Limited non-binary and binary gender comparative studies have looked at alcohol dependence and sexual functioning. This extends to couples' sexual wellness and the impact that alcohol might have on relationship satisfaction. This review identified a link between alcohol dependence, couple conflict, and poor relationship outcomes (Rodriguez et al., 2013; Kelly et al., 2002; McAweeney et al., 2005; Hone et al., 2013; Rohilla et al., 2020; Bhainsora et al., 2021). The research gap between cisgender men and women on alcohol dependence and sexual functioning is narrowing (Fama et al., 2020). But when comparing binary genders, male sexuality and alcohol consumption does not necessarily apply to women, and no comparison can be made about intersex, transgender, or gender non-conforming groups, given the lack of available research.

Nevertheless, of the available research, cisgender men and women with alcohol dependence differ cognitively, emotionally, and with their general health (Nixon et al., 2014). The underlying reasons for alcohol dependence might vary greatly between men and women, such as erectile dysfunction among man and orgasmic difficulties for women, and how this might impact their drinking behaviour (George et al., 2011). Lower levels of alcohol consumption have been associated with higher levels of sexual intimacy and relational efficacy. Conversely, higher levels of alcohol can decrease couples' connectedness, reduce efficacy, increase conflict, and decrease sexual intimacy (e.g., Kelly et al., 2002). The research suggests that those who are alcohol dependent perceive alcohol as having a positive effect on a relationship as well as minimising relationship difficulties. Perceptions of alcohol use among couples are important, particularly if a partner reported consuming much lower levels of alcohol (Rodriguez et al., 2013). This is associated with lower levels of relationship commitment and satisfaction, especially for men; however, the exact dynamics of this relationship remain unclear (Rodriguez et al., 2013).

This systematic review does raise a series of concerns. For example, the majority of research has been cross-sectional in design and more longitudinal is needed to explore counselling and support factors. Specifically, there is a lack of information about sexual functioning and couple conflict when both couples are alcohol dependent compared to when one couple is alcohol dependent; as well as how relapse and abstinence might impact sexual functioning. Certainly, understanding couples with alcohol dependence is multidimensional and holds important treatment and therapeutic implications in healthcare practice.

To date, no research could be found that has explored alcohol dependence and sexual dysfunction among intersex, transgender, or gender non-conforming groups. This is despite consistent research documenting the extensive experiences of stigma and discrimination for these populations in health and mental health care (Christian et al., 2018, Scandurra et al., 2019, Zeeman and Aranda, 2020). Broader research on LGBTQIA+ populations has tended to focus on risk-associated sexual behaviours rather than a generic look at sexual functioning in different contexts (Mattawanon et al., 2021). Unsurprisingly, this provides a limited understanding of sexual behaviour among these diverse and heterogenous groups. In 2018, Stonewall commissioned YouGov to carry out a survey among 5000 LGBTQIA+ individuals which included 871 transgender and non-binary people. Of these, 41% reported that healthcare staff lacked understanding of transgender peoples' health needs when accessing healthcare services (Stonewall., 2018). A meta-analysis of intersex individuals' healthcare experiences found that, of those who had undergone genital surgery, 47% were "unhappy with the outcome of surgery", with 70% experiencing issues with sexual desire, and 56% dyspareunia (Zeeman and Aranda, 2020). This extends to substance use and psychosexual services.

According to Arellano-Anderson and Keuroghlian (2020) transgender people are more at risk of alcohol dependence and yet the alcohol screening tools are designed for cisgender, heteronormative individuals. Further, gender non-conforming people on hormone therapy typically respond with changes in arousal and libido as a cisgender person would. So, many trans men experience an increase and many trans women, a decrease in libido (Mattawanon et al., 2021). Levels of sexual self-efficacy can increase among transgender people following gender-affirming surgery, though, as with intersex people, differences in hormones and the surgery type also impact sexual wellbeing (Mattawanon et al., 2021). A lack of research is not a sufficient reason to oversimplify the varied experiences of LGBTQIA+ people. Lastly, what role alcohol dependence might have on sexual function among transitioning trans people is also unknown and would benefit from investigation.

It should be noted that in this review, study outcomes were predominately based on self-report measures rather than on the measurement of physiological changes, such as testosterone, oestrogen, or blood alcohol levels. The use of self-report measures might suggest an over-evaluation or under-evaluation of alcohol use, relationship (dis)satisfaction, and levels of sexual functioning (Bradford and Meston, 2011), especially given the difficulties around blinding in these studies. The studies in this review were predominately based on heterosexual individuals and couples and included the use of heteronormative self-report assessments. The dominance of heteronormativity extends to practitioner-patient/client interactions (Dushyant Utamsingh et al., 2016). For example, in one study, heteronormative and non-heteronormative GP-patient interaction case vignettes were randomly allocated to LGBTQIA+ participants. Participants were asked to reveal how much health-related information they would disclose to their healthcare practitioner. Those allocated the heteronormative case vignettes were less likely to disclose health matters than those allocated to the non-heteronormative case vignette group (Dushyant Utamsingh et al., 2016). Trust and engagement in healthcare are critical in providing a holistic understanding of the client. This highlights the limited diverse assessments being used in health care services and the impact this might have on client-practitioner engagement.

On reflection, this review is not without its limitations. The strict inclusion and exclusion criteria may have excluded some relevant studies. Whilst this review aimed at minimizing heterogeneity, it might not reflect true representation of how alcohol dependence impacts sexual functioning and vice versa (Borges de Almeida and Garcia de Goulart, 2017). Also, the unpublished studies (file drawer effect) may have illuminated this review with regards to gender and sex differences, alcohol dependence, and sexual functioning (Rosenthal, 1979).

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## 5. Conclusion

To conclude, studies in this review confirm a relationship between alcohol dependence and sexual functioning, which appears to be dose specific. There were higher numbers of cisgender male studies conducted compared to cisgender female studies and no studies on other genders. For women, alcohol dependence and sexual dysfunction most frequently resulted in issues with sexual desire and orgasmic problems, sexual pain, lubrication, and arousal. Symptoms worsened during menopause. For men, the dominant sexual dysfunctions found including erectile dysfunction, premature ejaculation, sexual desire, and sexual satisfaction. When looking at partnerships (cisgender, heterosexual relationships only) research suggested that relationship dissatisfaction and loss of libido were associated with alcohol dependence.

For transgender individuals, some evidence suggests that sexual desire and arousal varied between transgender people's gender reassignment and hormone therapies. However, this was not in the context of alcohol dependence.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to declare.

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