Archives of Public Health

RESEARCH

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Quality of life and its correlated factors among patients with substance use disorders: a systematic review and meta-analysis

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Abstract

Background: Patients with substance use disorder (SUD) usually report lower quality of life (QoL) than other patients and as much as patients with other mental disorders. The present study investigated variables associated with QoL domains among patients with SUD.

Methods: Studies in English published before December 1st 2021, were searched for on PubMed, Scopus, Cochrane, and Web of Science to identify primary studies on factors associated with QoL domains among patients with SUD. After reviewing for study duplicates, the full-texts of selected papers were assessed for eligibility using PECO (Participants, Exposures, Comparison and Outcome) criteria: (a) participants: patients with SUD; (b) exposures: sociodemographic factors, clinical, and service use variables; (c) comparison: patient groups without SUD; and (d) outcomes: four domains of QoL (physical, mental, social, and environmental domains). Three researchers recorded the data independently using predefined Excel spreadsheets. The Newcastle–Ottawa Scale (NOS) was used for assessing risk of bias and rated each study in terms of exposure, outcome, and comparability. Pooled odds ratios (ORs) and β coefficient were utilized at a 95% confidence level, and because sampling methods differed between studies' pooled estimates, a random effects model was utilized.

Results: After the assessment of over 10,230 papers, a total of 17 studies met the eligibility criteria. Five studies (1260 participants) found that patients with SUD who were older were less likely to have a good physical Qol (OR = 0.86, 95% CI = 0.78, 0.95). Two studies (1171 participants) indicated that patients with SUD who were homeless were less likely to have a good environmental Qol (β = -0.47, $p = 0.003$). However, a better mental QoL was observed in four studies (1126 participants) among those receiving support from their family or friends (social networks) (OR = 1.05, 95% CI = 1.04, 1.07). Two studies (588 participants) showed that those using cocaine were less likely to have a good mental QoL (OR = 0.83, 95% CI = 0.75, 0.93). Two studies (22,534 participants) showed that those using alcohol were less likely to have a good physical QoL (β = -2.21, $p = 0.001$). Two studies (956 participants) showed that those having severe substance use disorders were less likely to have a good mental (β = -5.44, $p = 0.002$) and environmental (β = -0.59, $p = 0.006$) QoL respectively. Four studies (3515 participants) showed that those having mental disorders were less likely to have a good physical QoL (β = -1.05, $p = 0.001$), and another three studies (1211 participants) that those having mental disorders were less likely to have a good mental QoL (β = -0.33, $p = 0.001$). Finally, two studies (609 and 682 participants) showed that individuals who experienced trauma symptoms or mental disorders were less

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likely to have good social and environmental QoL, respectively (OR = 0.78, 95% CI = 0.61, 1.00) and (OR = 0.92, 95% CI = 0.9, 0.94).

Conclusions: The findings suggest the need for mental health services to improve the QOL among patients with SUD but further study is needed. Cocaine may cause behavioral changes which can increase the possibility of reckless and suicidal behaviors. Therefore, identifying cocaine user access, adherence, and satisfaction with treatment is recommended as an important component of adaptive functioning. Interventions that help patients with SUD get support from people within their social networks who support their recovery are also essential to their QoL.

Keywords: Substance use disorder, Quality of life, Cocaine use, Mental disorders

Background

Quality of life (QoL) is a key outcome in health service studies [1] and in clinical trials, measuring patient personal view of overall well-being [2]. The measure of QoL involves an extensive evaluation of the patient living conditions [3]. It has been especially promoted as an outcome measure among patients having chronic disorders like substance use disorders (SUD) or mental disorders, who usually have to sustain treatment without complete remission [4]. Although QoL has been differently defined in research and considering various populations, QoL mostly comprise physical, mental health, social, and environmental domains as core measures (e.g., economy, security and housing) [5]. More substandard QoL have been however reported in research among patients with SUD than for other patients, but comparable as patients with any psychiatric disorders [6, 7]. SUD is often considered a relapsing and chronic disorder, associated with somatic, psychological, and social comorbidities, and results in a shorter life expectancy [8].

Several clinical and sociodemographic variables have been investigated as linked with QoL variables among patients with SUD [9, 10], with mostly mixed-results found [11]. Main variables associated with QoL may be categorized into three areas: (i) sociodemographic, (ii) clinical, and (iii) service use variables. Being married [12, 13] or male [14, 15] and having good social support [16, 17] were positively associated with mental health, social and environmental QoL domains, while being older, homeless, or unemployed tended to negatively affect all QoL domains. Having mental disorders [18], severe SUD [19], or comorbidities [20, 21], being HIV-positive [22, 23], and experiencing trauma symptoms [16, 17] negatively affected all QoL domains. Receiving short-term methadone treatment [22] was positively associated with better QoL across all domains. While long-term methadone treatment negatively affected physical QoL [12], and receiving psychiatric medication [24] negatively affected physical and mental health QoL domains, respectively.

To the best of our knowledge, there is no previous systematic review or meta-analysis on variables associated with QoL among patients with SUD. More knowledge on these variables, which are key for successful treatment outcomes, may enable health providers to dispense more tailored clinical interventions to improve QoL for these patients. These study results may also be useful for policymakers and program evaluators to promote and prevent diseases. This study thus aimed to investigated variables associated with QoL domains among patients with SUD.

Methods

Study eligibility criteria and participants, exposures, comparison, and outcome (PECO) criteria

This systematic review was performed in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [25, 26]. Epidemiological studies assessing sociodemographic, clinical or service use variables associated with QoL among patients with SUD were included. SUD measured with DSM-5 diagnostics, including alcohol or drug use or polysubstance use disorders, based on self-report questionnaires or interviews were considered. Studies also had to report data on at least one of the four QoL domains (physical, mental health, social and environmental domains), which were the main "study outcome measures"; QoL had to be measured with validated psychometric scales. Moreover, studies needed to report odds ratios (Ors), and be published in English. The PECO criteria were used for: (a) participants: patients with SUD; (b) exposures: sociodemographic, clinical or service use variables; (c) comparison: patients without SUD; and (d) outcomes: one of the four QoL domains (physical, mental, social, and environmental domains).

Outcome measures

Studies that reported the association between sociodemographic factors, clinical, and service use variables with four domains of QoL (physical, mental, social and environmental domains) were included.

Definitions/criteria considered for SUD

The review included studies comprising on SUD ais a diagnostic category in DSM-5 which includes based-on self-report measures or interviews.

Definitions/criteria considered for QoL domains

Investigations Studies reporting data in at least one of the four all QoL domains (physical, mental, social and environmental) among patients with SUD an outcome was included in the review.

Study search strategy, selection process and data extraction

The search strategy was based on medical subject heading (MeSH) terms according to PECO criteria. Papers published from December 1st 1985 to December 1st 2021, and recorded on PubMed, Scopus, Web of Science, and Cochrane electronic databases were screened. Supplementary File 1 presents the details of the search strategy, including the combination of key words used in the different electronic databases. Exclusion of duplicate papers was conducted using EndNote X7 software (Thomson Reuters, New York, NY, USA). First, two researchers (A.B. and B.A.) independently screened the titles and abstracts for paper selection according to the study inclusion and exclusion criteria. Any disagreements between the two reviewers were resolved by a third reviewer (A.M.B.). Second, the studies were assessed according to full papers and eligibility study criteria. Manual searches on the reference list of the selected studies were also carried out to identify any additional studies. Data were then independently extracted by two researchers (B.A. and A.B.) for the final selected studies according to: author, year of publication, country, study design, sample size, population details, associated sociodemographic, clinical, or service use variables, and quality assessment. As requested, selected study authors were contacted to provide further details. Disagreements, which reached less than 10%, between the two researchers were resolved by a third researcher.

Study quality assessment

The Quality of each selected study was appraised based on the Newcastle–Ottawa Scale (NOS) [27–29]. This scale comprises three domains: (i) the selection domain, referring to the representativeness of the exposed group, selection of the non-exposed group, and ascertainment of exposure (three items for cross-sectional studies and four items for cohort); (ii) the comparability domain, referring to group comparability based on the paper design or analysis (one item each for both cross-sectional studies and cohort), and (iii) the exposure/outcome domain, referring to assessment of outcome (one item for of cross-sectional studies and three items for cohort) Publications were scored as unsatisfactory, satisfactory, good or very good. A maximum of eight points was possible for cohort and case control studies. Publications with a total score of 0–2 were "unsatisfactory," 3–4 were "satisfactory," 5–6 were "good" and 7–8 was "very good" respectively. In total, nine studies were rated as high quality [14, 17, 19, 22, 30–34], six were rated as good quality [16, 18, 20, 21, 35, 36], and two were rated as satisfactory quality [23, 24] (Table 1).

Data synthesis and statistical analysis

A meta-analysis was conducted to estimate pooled ORs and 95% confidence intervals (95% CI) to assess associations between QoL and sociodemographic, clinical and service use variables among patients with SUD. Heterogeneity between studies was assessed using I^2 statistics, which evaluates the percentage of variation among studies [37]. Based on the outcome of the I^2 index, a random effect model was chosen to estimate the pooled effect size in defined subgroups [38]. When I^2 indexed is lower than 50%, a fixed effect model is used, but if I^2 index is higher than 50%, a random effect model is used to estimate the pooled effect size [38]. To assess publication bias, Egger's approach was performed both graphically and statistically [39, 40]. A p-value of 0.05 was deemed to be statistically significant. The association between QoL and sociodemographic, clinical, and service use variables were assessed by ORs, β coefficient and 95% CI. The obtained results were visualized using forest plots. For data analysis, R 3.5.1 and Stata version 13.0 with the "meta" package was applied to perform the meta-analysis.

Results

Study selection process

Initially, 10,230 papers were identified through database searching and reference lists. Of these, 6524 studies were retained after removing duplicate. Considering titles and abstracts reviewed, 3158 studies were considered irrelevant, and were further excluded. Of the 548 full text retained, 536 studies were thereafter excluded according to inclusion criteria. Finally, 17 studies were included in the systematic review and meta-analysis [14, 16–24, 30–36] (Supplementary File 2).

Study characteristics

Most studies were published between 2005 and 2019, and conducted in the USA (Table 2). Most had a cross-sectional design. Study sample sizes ranged from 108 to 43,095 patients with SUD, with 15 studies including both males and females [14, 18, 20–24, 30–36, 41], and two females only [16, 17]. One study reported mean

Table 1 Risk of bias assessment using the Newcastle–Ottawa Scale

Study	Selection (***)	Comparability (*)	Exposure/ outcome (*)	Method of assessment	Quality Assessment	Quality Assessment score
Preau et al. [1]	***●	●	**	Newcastle–Ottawa Scale adapted for cohort studies	Very good	7
Mitchell et al. [2]	***	*	*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Very good	5
Rubenis et al. [3]	***	*	*●●	Newcastle–Ottawa Scale adapted for cohort studies	Very good	7
Brown et al. [4]	**	*	*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Good	3
Tracy et al. [5]	***	*	*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Very good	5
Yen et al. [6]	**		*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Satisfactory	3
Strada et al. [7]	**	*	*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Good	3
Wang et al. [8]	***	*	*●●	Newcastle–Ottawa Scale adapted for cohort studies	Very good	7
Ubuguyu et al. [9]	***●	*	*●	Newcastle–Ottawa Scale adapted for cohort studies	Very good	7
Lahmek et al. [10]	***		*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Good	4
Pokhrel et al. [11]	***		*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Good	4
Kertesz et al. [12]	*●	*	*	Newcastle–Ottawa Scale adapted for cohort studies	Satisfactory	4
Dawson et al. [13]	***	*	*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Very good	5
Korthuis et al. [14]	***		*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Good	4
Lev-Ran et al. [15]	***	*	*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Very good	5
Daeppen et al. [16]	***		*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Good	4
Byrne et al. [17]	***	*	*	Newcastle–Ottawa Scale adapted for cross-sectional studies	Very good	5

*** For cross-sectional studies**

●For cohort studies

age of 23.5 years [14], six of them reported mean age ranged between 31.1 to 37.1 years [16, 17, 22, 24, 31, 33], six of studies found mean age ranged between 41.1 to 46.1 years [20, 21, 23, 30, 35, 36] and four studies did not report mean of age [18, 19, 32, 34]. Seven studies assessed all four QoL domains [16, 17, 22, 23, 30, 31, 33], eight QoL physical and mental health domains [14, 18–21, 32, 34, 36], and two QoL mental health domain only [24, 35].

Considering physical QoL domain, thirteen studies evaluated associations between this QoL domain with older age [16, 17, 19, 30, 31], being male [14, 16], homeless [16, 23, 36], HIV positivity [22, 23], with specifically alcohol use disorders [34, 36], severe substance use disorders [19, 21], mental disorders [16, 18, 21, 32], or comorbidity [20, 21, 23], or receiving methadone treatment [21–23]. Among these studies, four were cohort and nine cross-sectional studies, while four were conducted in low-income countries, published between 2007 to 2019 and had sample sizes ranged from 108 to 43,093.

Regarding mental health QoL domain, fourteen studies evaluated associations of this QoL domain with having social network [16, 17, 19, 24], being female [14, 35], homeless [23, 24], with alcohol use disorders [24, 34, 35], cocaine use [30, 32], heroin use disorders [30, 33], severe substance use disorders [18, 24], having mental disorders [16, 18, 35], or receiving methadone treatment [21–23]. Among these studies, four were cohort and the others cross-sectional studies, which three conducted in

Table 2 Main characteristics of the studies selected

Author	Sample size	Year of publication	Year of implementation	Country	Design	Quality of the evidence	Adjusted variables in the studies
Preau et al. [1]	243	2007	1995–97	France	Cohort	Very good	Sex, education status and employment status
Mitchell et al. [2]	300	2015	2015	USA	Cross-sectional	Very good	Sex and injection drug use
Rubenis et al. [3]	108	2017	2017	Australia	Cohort	Very good	Age, sex, year of education and employment status
Brown et al. [4]	369	2015	2009–2011	USA	Cross-sectional	Good	Education status, race and employment status
Tracy et al. [5]	240	2012	2009	USA	Cross-sectional	Very good	Age, educational status and race
Yen et al. [6]	802	2015	2012–2013	Taiwan	Cross-sectional	Satisfactory	Age and educational status
Strada et al. [7]	2176	2019	2014–2016	Germany	Cross-sectional	Good	Employment status, housing status, having and living with children
Wang et al. [8]	368	2012	2007–2008	Taiwan	Cohort	Very good	Age and educational status
Ubuguyu et al. [9]	288	2016	2011–2012	Tanzania	Cohort	Very good	Age, sex and employment status
Lahmek et al. [10]	414	2009	2009	France	Cross-sectional	Good	Race and education status
Pokhrel et al. [11]	682	2017	2015	Nepal	Cross-sectional	Good	Age and sex
Kertesz et al. [12]	274	2005	2005	USA	Cohort	Satisfactory	Employment status, housing status and income status
Dawson et al. [13]	22,245	2009	2001–2002	USA	Cross-sectional	Very good	Age, sex and family history
Korthuis et al. [14]	289	2012	2004–2009	USA	Cross-sectional	Good	Age, educational status and race
Lev-Ran et al. [15]	43,093	2012	2012	Canada	Cross-sectional	Very good	Age, sex, income status, race and marital status
Daeppen et al. [16]	160	2014	2014	Switzerland	Cross-sectional	Good	Employment and marital status
Byrne et al. [17]	190	2016	2016	Ireland	Cross-sectional	Very good	Sex and age

low-income countries and published between 2005 to 2019, and the sample sizes ranged from 160 to 43,093.

Considering social QoL domain, four studies investigated association of this QoL domain with being male [23, 33], having social network [16, 17], or trauma symptoms [16, 17]. These studies were all cross-sectional and conducted in low-income countries. They were published between 2012 to 2016, and the sample sizes ranged from 190 to 802.

Regarding environmental QoL domain, four studies considered associations of this QoL domain with being male [23, 33], homeless [16, 23] or having severe substance use [16, 18]. Thesestudies were all cross-sectional and two conducted in low-income countries. They were published between 2015 to 2016, and the sample sizes ranged from 190 to 802.

Meta-analysis

Characteristics associated with physical QoL domain among patients with SUD

The largest estimation of characteristics associated with physical QoL domain was 1.73 for receiving methadone treatment and the smallest 0.48 for patients having HIV. The study found that patients with SUD who were older were 0.86 times less likely to have good physical Qol (OR = 0.86, 95% CI = 0.78, 0.95) (Fig. 1). Patients who had specifically alcohol use disorders (β = -2.21, $p = 0.001$) or mental disorders (β = -1.05, $p = 0.001$) were also less likely to report good physical QoL (Fig. 2). There were no significant associations found between physical QoL and being male (β = -5.91, $p = 0.33$), homeless (β = -1.47, $p = 0.24$), with HIV (OR = 0.48, 95%CI = 0.22–1.04), comorbidity (OR = 0.67, 95%CI = 0.44–1.02), severe substance use disorders (OR = 0.65, 95%CI = 0.33–1.28), or receiving methadone treatment (OR = 1.73, 95%CI = 0.66–4.54) (Figs. 1 and 2).

Characteristics associated with mental health QoL domain among patients with SUD

The largest estimation of characteristics associated with mental health QoL domain was 1.40 for receiving methadone treatment and the smallest 0.83 for having cocaine use disorders. Patients having social network were 1.38 times more likely to have a high mental health QoL (OR = 1.38, 95% CI = 1.15, 1.66), while patients having cocaine use disorders were found 0.83 times less likely to have a good mental health QoL (OR = 0.83, 95% CI = 0.75, 0.93) (Fig. 3). Patients who had severe substance use disorders (β = -5.44, $p = 0.002$) or had mental disorders (β = -0.33, $p = 0.001$) were also less likely to

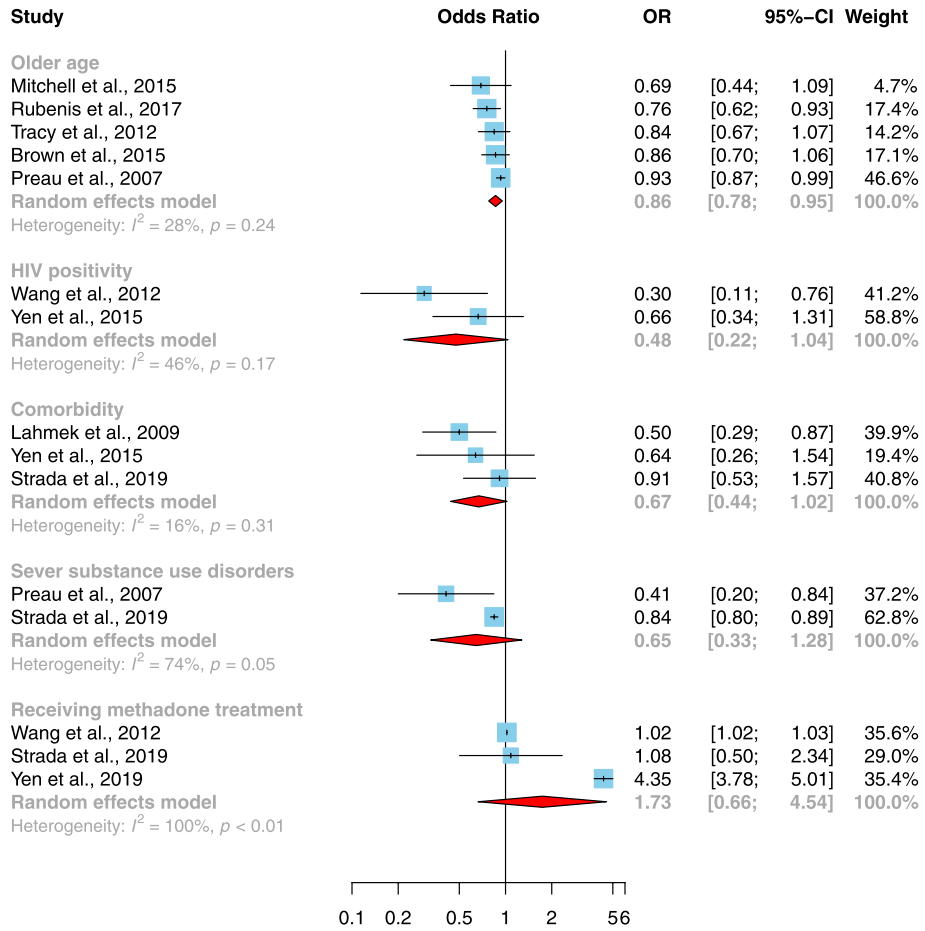

Fig. 1 Forest plots for the association between characteristics associated with physical QoL domain among patients with SUD

report a good mental health QoL domain (Fig. 4). There were no significant associations found between receiving methadone treatment (OR = 1.40, 95%CI = 0.78–2.51), being female (β = -2.11, p = 0.09), homeless (β = -0.50, p = 0.33), with alcohol use disorders (β = -3.39, p = 0.07), heroin use disorders (β = -0.49, p = 1.0), and mental health QoL domain (Figs. 3 and 4).

Characteristics associated with social QoL domain among patients with SUD

The largest estimation of characteristics associated with social QoL domain was 1.22 for those with social network and the smallest 0.56 for patient having mental disorders. This study showed that patients who had trauma symptoms were 0.78 times less likely to have high social QoL (OR = 0.78, 95% CI = 0.61, 1.00) (Fig. 5). No significant associations were found between being male (OR = 1.22, 95%CI = 0.94–1.58), having social network (β = -0.66, p = 0.34), or mental disorders (OR = 0.56, 95%CI = 0.21–1.52) and social QoL (Figs. 5 et 6).

Characteristics associated with environmental QoL domain among patients with SUD

The largest estimation of characteristics associated with environmental QoL domain was -0.47 for those who homeless and the smallest -0.59 for patient having severe substance use disorders. Patients with SUD who had mental disorders were 0.92 times less likely to have high environmental QoL (OR = 0.92, 95% CI = 0.90, 0.94) (Fig. 7). Patients who were homeless (β = -0.47, p = 0.003) or had severe substance use (β = -0.59, p = 0.006) were less likely to report good environmental QoL (Fig. 8). There were no significant associations found between being male (β = -2.11, p = 0.09) and environmental QoL.

Publication bias

Egger's tests showed evidence of publication bias (Egger's test: p < 0.001). The Doi plot and the Luis Furuya-Kanamori (LFK) asymmetry index were also applied. The closer the value of the LFK index to 0, the more symmetrical the Doi plot. LFK index values that are outside

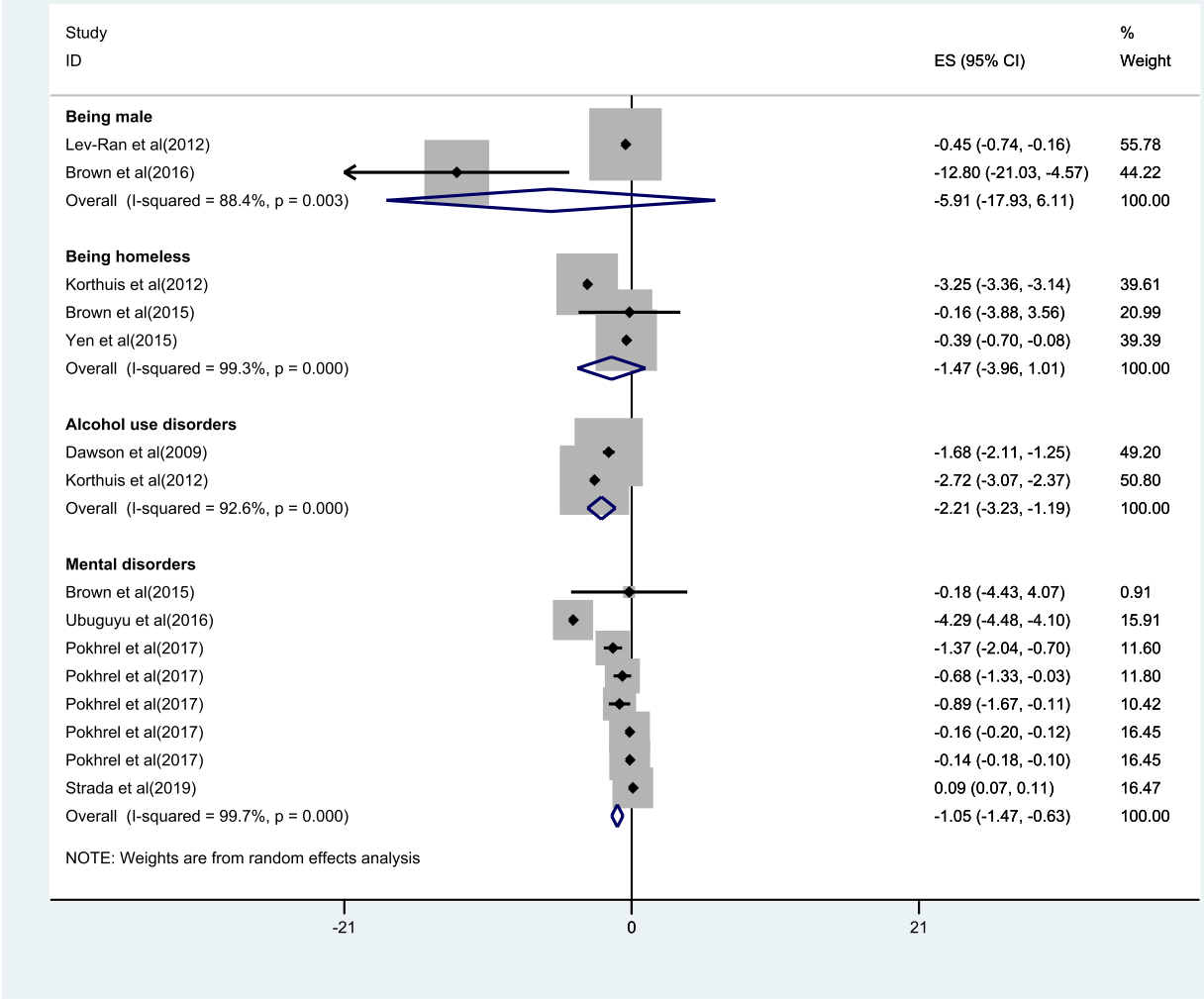

Fig. 2 Pooled standardized beta coefficients (with 95% confidence intervals), representing the association between characteristics associated with physical QoL domain among patients with SUD

of the interval between −1 and +1 are consistent with asymmetry. According to publication bias test, a significant publication bias among studies was noted (C = 2.38; *P*-value = 0.001). Therefore, metatrim analysis was performed in order to remove the effect of publication bias on the pooled OR. The meta-trim analysis showed that the pooled OR was 0.17 (95%CI: 0.13–0.21) in the random effect model.

Discussion

Of the included studies, 59% examined sociodemographic determinants such as age, sex, homeless and social network, 88% included clinical characteristics such as HIV, comorbidity, alcohol use, cocaine use, heroin use and severe substance use disorders, mental disorders, trauma symptoms with four QoL domains, while only 17% of studies considered receiving methadone treatment as service use variable associated with four QoL domains among patients with SRD. It can be concluded that although service use variables have a significant role in improving quality of life of the patients with SUD, they have been rarely considered in the studies. Thus, it is recommended to consider these variables for future studies.

The present meta-analysis showed that patients with SUD who were older, had alcohol use disorders, had mental disorders were less likely to have good physical QoL. However, better mental health QoL was observed among those having social network, while patients with cocaine use disorders, severe substance use disorders

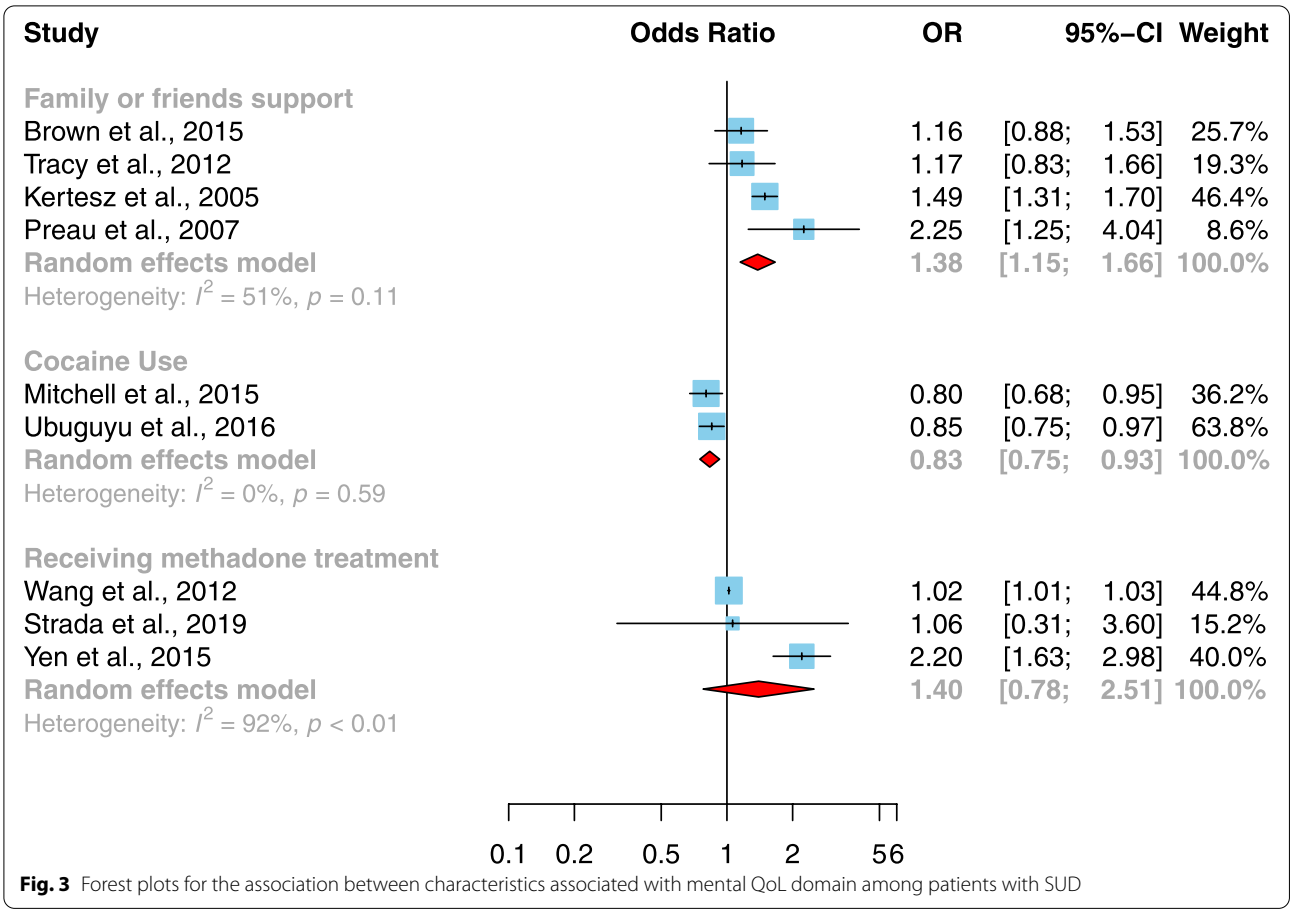

Fig. 3 Forest plots for the association between characteristics associated with mental QoL domain among patients with SUD

and mental disorders were less likely to have good mental health QoL. Moreover, patients who were homeless, having severe substance use disorders and experiencing trauma symptoms were less likely to have good social QoL, and those experiencing mental disorders less likely to have good environmental QoL.

Regarding sociodemographic determinants, the negative association between older age was physical QoL concurs with some previous studies [16, 31]. These results may be explained by older aged decreasing physical health, and deteriorating immune systems, and thus increasing the likelihood of having mental disorders. These results also showed that patients with SUD being homeless were less likely to have good environmental QoL. Homelessness increased the risk of morbidity, such as pedal edema and abrasions, cuts, and rashes [42, 43], and it is reported that patients with mental disorders are more likely to have physical health problems [44]. Medical resources for the homeless population are found often inadequate [45]. Moreover, the high basic needs of this population may prevent them to seek help for their mental disorders [46]. Previous studies also found a relationship between increased mental health QoL and perceived social network among patients with SUD [41, 47]. Perceived social support and being in a stable relationship were reported to promote mental health QoL [41, 48]. Social support might prevent the adverse outcomes among patients with SUD on their QoL. This issue has been extensively explored among patients with SUD [49–51]. Since social support may reduce the change in subsequent depressive and anxious symptomatology and serve as a protective effect with regard to the perception of the QoL [50].

Considering clinical variables, there was an inverse association between patients who had mental disorders and physical, mental health and environmental QoL. The past-year prevalence of comorbid mental disorders was estimated to be 30%-50% for mood disorders, and 10%-20% for anxiety disorders [52, 53]. The results of a six-year cohort study, as well as other research, has reported the considerable persistence of high rates of comorbidities over time among patients with SUD [53]. Notably, individuals with a comorbid diagnosis have restricted access to necessary mental health interventions. For example, they might encounter inadequate collaboration between various medical and mental health professionals,

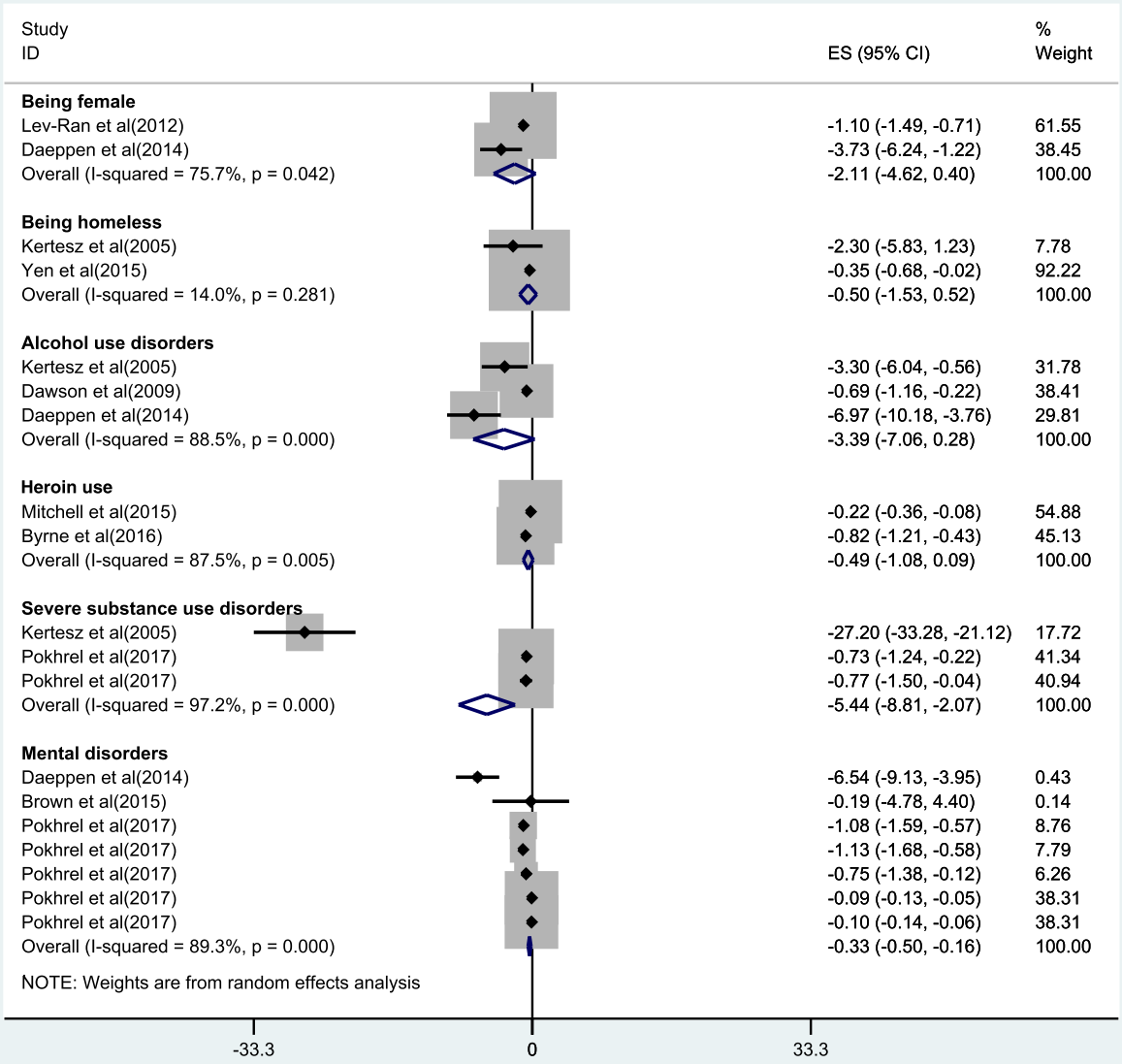

Fig. 4 Pooled standardized beta coefficients (with 95% confidence intervals), representing the association between characteristics associated with mental QoL domain among patients with SUD

leading to the under-diagnosis of comorbidities, which might be to some extent attributed to insufficient training on psychiatric conditions among physicians [54, 55]. In addition, it is believed that mental health diagnosis and psychopharmacological interventions are associated with biopsychological QoL. Therefore, considering SUD patients' mental health is important because it correlates with biopsychological health and functioning. Considering the negative associations between severe SUD and mental health and environmental QoL, previous studies have demonstrated that patients with such co-occurring disorders have poorer QoL than other populations [56, 57]. Poor QoL may also be a predictor of treatment readiness. Studies have shown that the patient motivation of reducing negative effects of SUD contributes to improve QoL, QoL being a more explicit goal of treatment among patients than reducing the substance use itself [58, 59]. One possible explanation could be patients who have severe SUD may be polysubstance users and/or inject drugs. Regarding the inverse association between

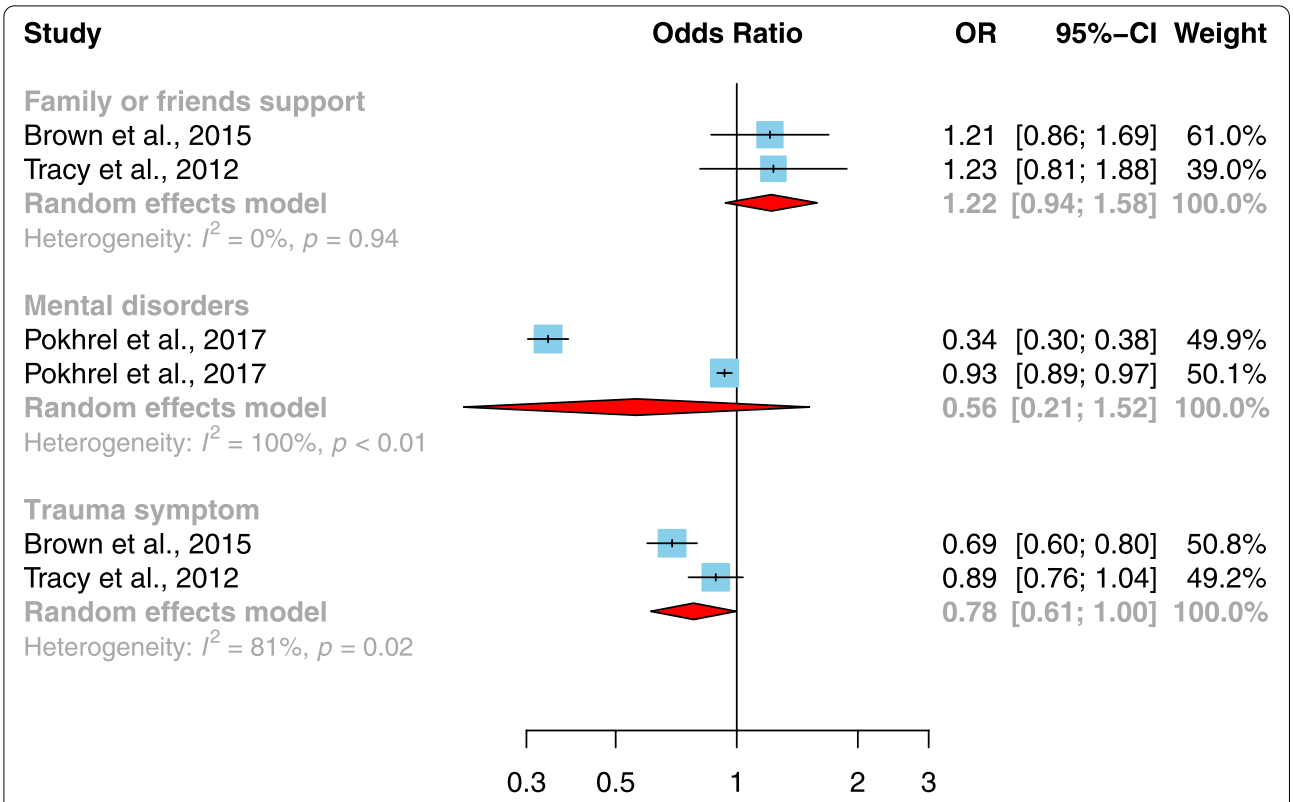

Fig. 5 Forest plots for the association between characteristics associated with social QoL domain among patients with SUD

alcohol use disorders and good physical QoL, previous studies confirmed negative associations between higher alcohol use or chronic drinking and overall level of QoL [60, 61]. Alcohol use disorders may also lead to social dysfunctions, disrupting family relationship and employment [62]. In addition, due to the difficulties in interpersonal interactions and dealing with economic problems, it may cause high-risk behaviors [63]. Considering the inverse association between patients with cocaine use disorders and good mental health QoL, a previous study [64] explored young regular cocaine users who were not under treatment and reported a declined QoL among those with more severe cocaine dependence. This study also noted that cocaine use severity explained the lower of QoL in this population. Cocaine use disorders is associated with critical biopsychosocial challenges, resulting in decreased pharmacotherapy treatment outcomes [32, 65]. Some of patients with SUD withdrawal symptoms may alleviate their symptoms by cocaine use. Having trauma symptoms seemed to have a higher effect on social QoL among patients with SUD because there was a significant association between the social aspect of QoL and trauma symptoms [17]. In this respect, previous studies have signified the necessity for developing trauma-centered interventions for this group of patients [66], as well as comprehensive healthcare services to address trauma symptoms and substance abuse.

Methodological considerations related to results

The studies included in the present systematic review and meta-analysis have some methodological concerns. First, various instruments for assessing QoL were used such as 36-Item Short Form Survey (SF), SF-12 and the WHO QoL-BREF consequently, comparisons between different types of SUD are challenging. Generic instruments may be useful to be able to make comparisons between patients with SUD and the general population or other high-risk groups. However, generic instruments may disregard specific crucial dimensions of QoL among specific populations, including patients with SUD. Third, the studies which reported sociodemographic variables were two studies (11%) for homelessness, five studies (29%) for older ages, and four studies (23%) for social network. Although, these studies were not heterogeneous, due to the few number of studies readers should be cautious when interpreting the findings. Regarding clinical variables, there were three studies (17%) for severe substance use disorder, two studies (11%) for cocaine use disorder and two studies (11%) for alcohol use disorder. High heterogeneity were observed among the last two

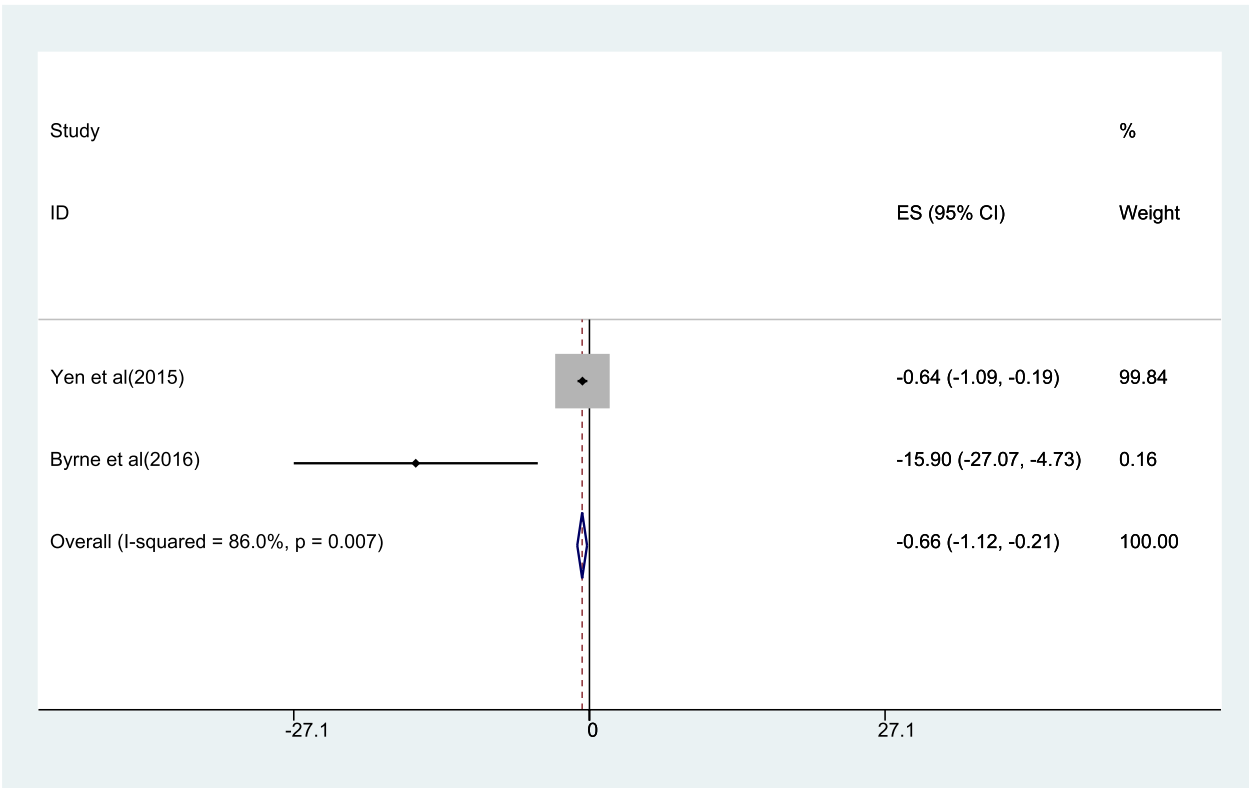

Fig. 6 Pooled standardized beta coefficients (with 95% confidence intervals), representing the association between characteristics associated with social QoL domain among patients with SUD

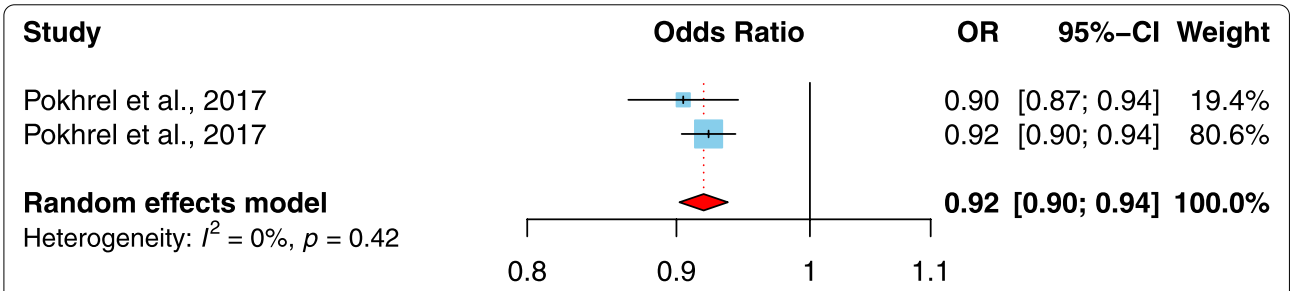

Fig. 7 Forest plots for the association between characteristics associated with environmental QoL domain among patients with SUD

mentioned variables therefore; the associations may be weak. In addition, due to low number of studies caution should be exercised when interpreting the results. Mental disorders were the only variables which were considered more often, in eight studies (47%), and despite the high heterogeneity the reported association was strong.

Study limitations

There are several limitations to note. First, excluding studies published in languages other than English might have led to the loss of some relevant studies. Second, although, the search was conducted using four databases, it was arguably not as exhaustive as it could have been. Third, most studies that were found reported the Beta coefficient through logistic regression or evaluated general QoL rather than the four QoL domains, so these were removed from the final analysis. Fourth, there were insufficient studies to be categorized for different qualities to run sensitivity analysis. Finally, since there were only two studies in some of the associations examined, as aforementioned, caution should be exercised when interpreting this study results.

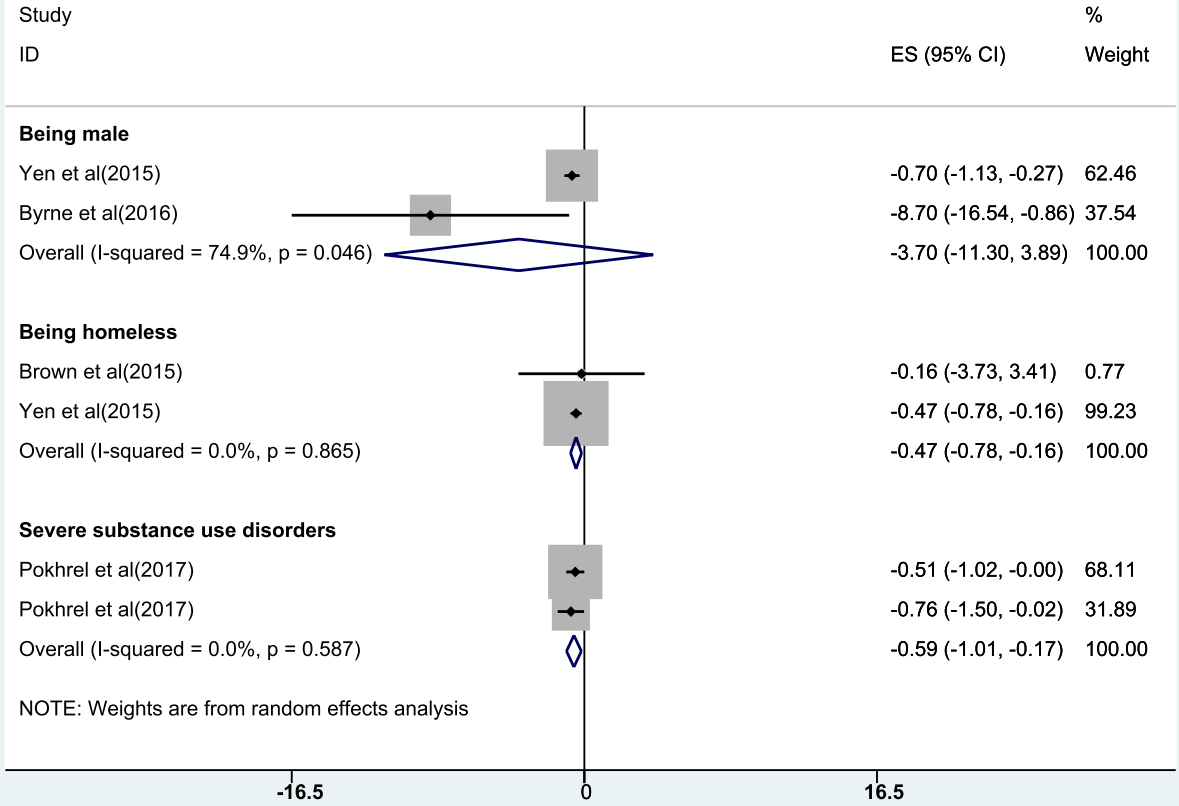

Fig. 8 Pooled standardized beta coefficients (with 95% confidence intervals), representing the association between characteristics associated with environmental QoL domain among patients with SUD

Conclusions

Lower QoL in older people may be due to multi-morbidity. It could be useful to assess the mental disorders and chronic physical illnesses in older patients with SUD. Programs considering homeless individuals with mental disorders may be most effective at improving quality of life and well-being by emphasizing the preserving stable housing and providing of services to address subsistence needs and physical healthcare services. Interventions that help patients with SUD to get support from people within their networks who support their recovery are also essential to their QoL. Frequent screening for mental disorders including depression and anxiety among patients with SUD can decrease under-reporting of comorbid disorders, which is a significant obstacle to respond to patient needs. The findings suggest the need for health services to improve the QOL among patients with SUD but further study is needed. Cocaine may cause behavioral changes which can increase the possibility of reckless and suicidal behaviors. Therefore, identifying cocaine user access, adherence, and satisfaction with treatment is recommended, as an important component of adaptive functioning. Since alcohol use disorders are risk factors for lower QoL, recovery from alcohol use disorders may be improved by enhancing patient's QoL. Therefore, the hope of a better life could motivate patient recovery [67]. Finding of the present study confirmed the need for more trauma-informed interventions and services for this population as well as implementing treatment models for trauma symptoms and substance abuse.

Abbreviations

QoL: Quality of life; SUD: Substance use disorder; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; MeSH: Medical subject heading; PECO: Participants, Exposures, Comparison, Outcomes; ORs: Odds ratios; NOS: Newcastle Ottawa Scale; CI: Confidence interval.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s13690-022-00940-0.

Additional file 1: Supplementary File 1. Search strategy.

Additional file 2: Supplementary File 2. PRISMA flow diagram.

Acknowledgements
None.

Authors' contributions
BA. Conceived the study BA. collected all data. RM, and BA analyzed and interpreted the data. BA, AB and AHB drafted the manuscript. MDG and MJF contributed to the revised paper and were responsible for all final editing. All authors commented on the drafts of the manuscript and approved the final copy of the paper for submission.

Funding
This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

Availability of data and materials
The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
This study was an analysis of preexisting literature and did not use human participants.

Consent for publication
Not applicable.

Competing interests
The authors declare that there are no conflicts of interest.

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Received: 23 January 2022 Accepted: 25 July 2022
Published online: 04 August 2022

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