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Review

Hispanic participants in the National Institute on Drug Abuse's Clinical Trials Network: A scoping review of two decades of research

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ABSTRACT

Introduction: Hispanics significantly underutilize substance abuse treatment and are at greater risk for poor treatment outcomes and dropout. Two decades of research from the National Drug Abuse Treatment Clinical Trials Network (CTN) offers an opportunity to increase our understanding in how to address the disparities experienced by Hispanics in substance abuse treatment.

Methods: A scoping review was utilized to determine what has been learned from the CTN about Hispanic populations with substance use disorder. A systematic search was conducted within the CTN Dissemination Library and nine databases. Potentially relevant studies were independently assessed by two reviewers for inclusion.

Results: Twenty-four studies were included in the review. Results identified issues in measurement, characteristics of Hispanic substance use, effective interventions, and gaps for future research. Characteristics that interfere with treatment participation were also identified including low employment rates, less likelihood of having insurance, lower rates of internet access, and increased travel time to services, as were treatment issues such as high rates of alcohol and tobacco use. Effective interventions were identified; however, the effectiveness of these interventions may be limited to specific factors.

Conclusions: Despite efforts to improve inclusion of minority populations, Hispanics remain underrepresented in clinical trials. Future research including Hispanic populations should examine measurement equivalence and consider how cultural and historical experiences, as well as patient characteristics, influence utilization of services. Finally, more studies are needed that examine the impact of structural factors that act as barriers to treatment access and engagement and result in significant disparities in treatment outcomes.

1. Introduction

Prevalence of lifetime and past-year drug use was 12% and 14% respectively among Hispanic individuals who recently participated in the National Survey on Drug Use and Health (NSDUH), and persons with an annual income less than $20000 were overwhelmingly more likely to report having substance abuse problems, suggesting significant disproportionate prevalence (Baptiste-Roberts & Hossain, 2018). Racial and ethnic differences in access and utilization of treatment are confounded by income, insurance, severity of the disorder and interaction with the criminal justice system (Lê Cook & Alegría, 2011). While 40% of admissions to publicly funded treatment programs come from minority populations, Hispanics are at greater risk for poor treatment outcomes and are less likely to complete substance abuse treatment, primarily as the result of greater unemployment and housing instability (National Institute on Drug Abuse (NIDA), 2011; Saloner & Lê Cook, 2013).

Specialty treatment is rare across all racial-ethnic groups; however,

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Hispanics with substance use disorders (SUD) significantly underutilize treatment compared to Blacks and Whites, disparities which persist even when controlling for insurance status, socio-demographics, and problem severity (Pinedo, 2019; Manuel, 2017). Conversely, Hispanic populations are more likely than whites to be mandated to court-ordered treatment and may have greater access to publicly funded substance abuse treatment services that are typically located in more disadvantaged neighborhoods; low socio-economic status and enrollment in Medicaid also predict receipt of specialty treatment (Lê Cook & Alegría, 2011; Iguchi, Bell, Ramchand, & Fain, 2005).

Key challenges exist in addressing disparities in substance abuse treatment outcomes which include understanding the complexity of patterns of use and differences in adherence to treatment (Galea & Rudenstine, 2005). Issues such as mechanisms of change, correlates of drug use, and the presence of comorbid mental and physical disorders also vary for specific subgroups (Burlew, Feaster, Brecht, & Hubbard, 2009; Sanchez et al., 2015). Hispanics often avoid specialty treatment due to barriers stemming from perceived lack of treatment efficacy, recovery goals, stigma, lack of social support, cultural factors, and family conflict (Fish, Maier, & Priest, 2015; Pinedo, 2019; Pinedo, Zemore, & Rogers, 2018).

The National Drug Abuse Treatment Clinical Trials Network (NIDA CTN) is a collaboration of researchers and treatment providers who develop, refine, and evaluate novel interventions for the treatment of substance abuse. Two decades of NIDA CTN research offers a unique opportunity to examine differences in substance abuse treatment outcomes for racial and ethnic minority populations (Burlew et al., 2009; Burlew & Sanchez, 2017; Carroll et al., 2007). CTN studies that either analyzed the data separately for Hispanics or included race-ethnicity as a moderator have the potential to contribute substantially to the knowledge base on Hispanic substance use.

A recent systematic scoping review of research on Black participants in the CTN highlighted important issues critical to understanding and treating substance misuse among Black people (Montgomery, Burlew, Haeny, & Jones, 2019). However, no synthesis of the CTN findings on Hispanic substance use has been undertaken. Therefore, our objective was to conduct a scoping review of two decades of CTN studies to determine what has been learned about Hispanic populations with SUD and related conditions.

2. Methods

A scoping review summarizes and disseminates research findings while identifying research gaps in existing literature yet differs from traditional systematic reviews by providing a map of the literature without quality assessment or extensive data synthesis (Arksey & O'Malley, 2005; Armstrong, Hall, Doyle, & Waters, 2011). This scoping review utilizes the methodological framework of Arksey and O'Malley (2005) and consists of five stages: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data and (5) collating, summarizing and reporting the results.

2.1. Identifying the research question

Given the lack of existing reviews of Hispanics participants in CTN trials, the following research question for the current scoping review was purposefully broad to capture a wide range of findings relevant to the population: What is known from the existing published literature about Hispanics with SUD enrolled in NIDA CTN studies?

2.2. Identifying relevant studies/study selection

The search for relevant studies took place in July 2018. The primary source for identifying studies was the CTN Dissemination Library (http://ctndisseminationlibrary.org/), a digital repository of resources for CTN members and the public. To enhance comprehensiveness and identify any additional studies that were not present in the CTN Dissemination Library, searches were also conducted in PubMed, Academic Search Complete, CINAHL Complete, Health Source: Nursing/Academic Edition, MEDLINE, PsycARTICLES, Psychology and Behavioral Sciences Collection, PsycINFO, and Google Scholar. Finally, a backward search of reference lists in relevant articles was also conducted. The keywords for the search were “Hispanic* OR Latin*” AND “NIDA CTN OR National Institute on Drug Abuse Clinical Trials Network OR National Drug Abuse Treatment Clinical Trials Network.” Potentially relevant studies were uploaded into Covidence, internet-based systematic review software, for screening and review.

Studies that met the following criteria were included in the review: (1) included data from CTN studies or affiliated treatment programs and (2) the full sample was Hispanic and/or findings were reported that specifically focused on Hispanics. If studies included race as a moderator of outcomes, but categorized race as “White and Non-White” or in some other way that does not explicitly compare Hispanics to another racial/ethnic group, they were excluded. Literature reviews and studies that focused on substance use program or workforce characteristics were also excluded. Finally, studies that implemented adaptations of CTN studies for the Mexican Clinical Trials Network on Addiction and Mental Health (Horigian et al., 2015) were also excluded.

As shown in Fig. 1, 80 articles were identified as potentially relevant studies. After importing the articles into Covidence, 22 duplicate articles were removed. Two independent reviewers assessed the remaining studies for inclusion. Any disagreements among the reviewers were marked and reviewed by the research team to reach an agreement. First, studies were screened by title and abstract, which eliminated two of the studies. Full-text review of the remaining 56 studies excluded an additional 32 studies for not meeting inclusion criteria, yielding a total of 24 studies included in the review.

2.3. Charting the data

Key information was charted for each of the 24 studies included in the review. This process followed a ‘descriptive-analytical’ method (Arksey & O'Malley, 2005) and collected standard information from each study including: CTN protocol, overall sample size, percentage of Hispanics, age of participants, inclusion criteria for the study/sampling procedures, interventions used, measures used, and findings related to Hispanics.

3. Results

3.1. Study characteristics

A total of 24 published studies met inclusion criteria for the current study (see Table 1 for a list of studies by author). Findings from the studies included primary outcomes from CTN trials (n = 2), secondary analyses using CTN trial data (n = 20; including pooled analyses), and survey data sampled from CTN-affiliated treatment programs (n = 2). Of the 24 studies, seven (29.2%) had samples that were 100% Hispanic, with a majority of these (n = 6) utilizing data from the same CTN protocol (CTN 0021: MET [Motivational Enhancement Therapy] to Improve Treatment Engagement and Outcomes for Spanish-Speaking Individuals Seeking Treatment for Substance Abuse; Carroll et al., 2009). Hispanic representation among the remaining studies ranged from 10% to 44% of the samples for those using single data sets (n = 11) and 6% to 27% of the samples for the pooled analyses (n = 6). Most studies consisted of adult participants and only three studies (Feaster et al., 2010; Robbins et al., 2011; Walker et al., 2014) consisted of adolescents - two of which used data from the same protocol (CTN 0014: Brief Strategic Family Therapy for Adolescent Drug Abusers).

Results were organized into four themes: (1) study engagement and assessment, (2) obtained baseline sample characteristics, (3) substance

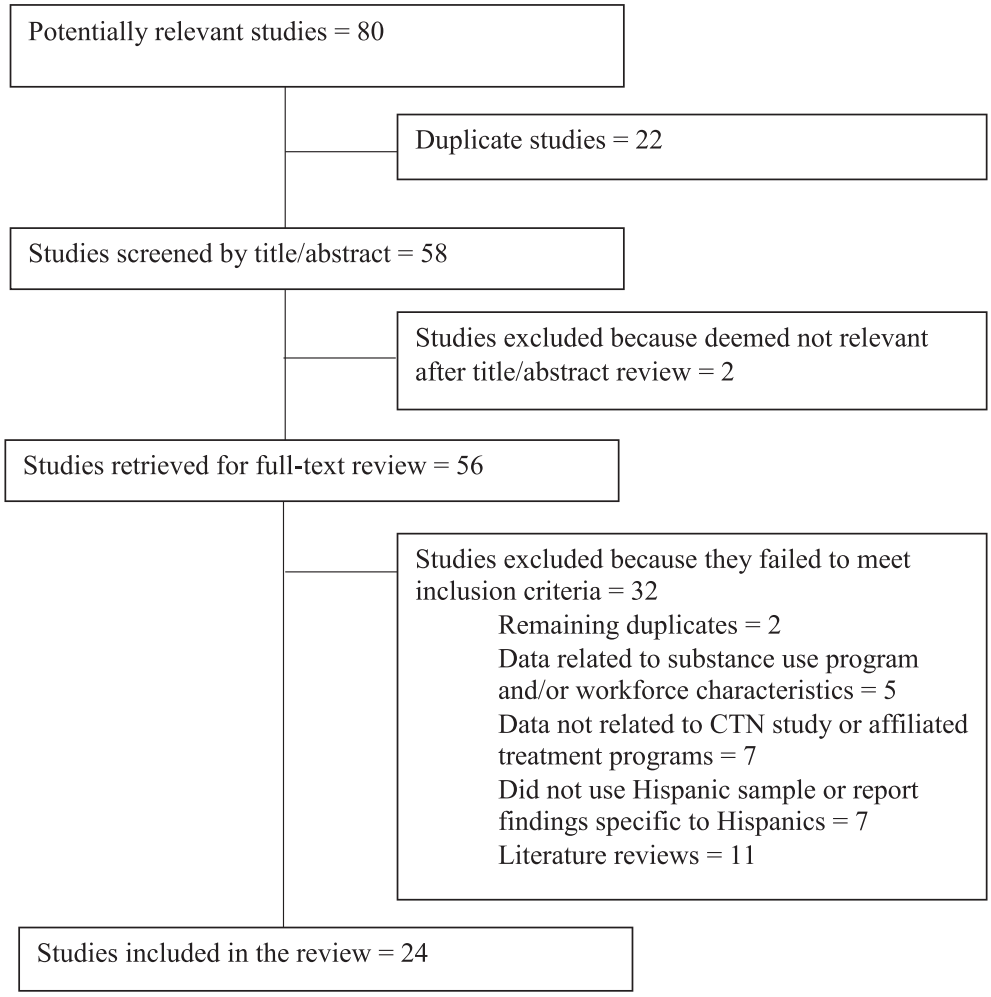

Fig. 1. Search results and study selection flow chart.

use treatment outcomes, and (4) HIV/risky sex behaviors. The study engagement and assessment theme findings relate to recruitment, retention, and measurement. The baseline characteristic theme includes findings related to the sociodemographic characteristics of Hispanic participants as well as descriptives about drug use and comorbidities. The substance use treatment outcomes theme describes findings among the studies that reveal within-treatment or follow-up substance use outcomes among Hispanics with SUD who participated in a behavioral or medication CTN trial. The HIV/risky sex behaviors theme included studies with findings related to HIV and risky sex behaviors among Hispanics with SUD in the CTN. Key findings related to Hispanic participants in each study can be found in Table 1.

3.2. Study engagement and assessment

3.2.1 Recruitment and retention

Few studies made efforts in their recruitment/sampling procedures to increase Hispanic representation in their sample. Only one study reported specific efforts to maximize racial/ethnic representation such as including treatment providers that served Blacks and Hispanics (Robbins et al., 2011). Similarly, Sanchez et al. (2015) reported that geographic location of the treatment programs was an important consideration in enhancing representation in their trial. When comparing the representativeness of a clinical trial sample to national samples of the target population, McClure et al. (2017) found that participants in a cannabis cessation trial had a greater portion of Hispanic participants than expected based on national data.

Study and treatment retention rates were not reported by multiple studies (n = 19), which were secondary and pooled analyses. In one study of Spanish-speakers, 66% of participants completed treatment and 79% completed the three-month follow up (Carroll et al., 2009). Other studies utilizing data from single protocols in which Hispanics were only a portion of the sample (n = 3) found no significant differences between racial/ethnic groups in study attrition/retention (Brown et al., 2010; Campbell et al., 2017; Robbins et al., 2011). These findings are consistent with the two pooled analyses in the review that found no significant effects of race/ethnicity on retention in CTN trials (Korte, Rosa, Wakim, and Perl, 2011b; Magruder, Ouyang, Miller, & Tilley, 2009).

3.2.2 Measurement

Outcome measures were mostly related to substance use along with treatment retention (i.e., attendance) and engagement (i.e., participation). Some studies assessed variables other than substance outcomes and treatment response. Psychometric research highlighted systematic error in measurement when examining the effect of various treatments among racial and ethnic minorities. In one study, Feaster and colleagues (2010) reported measurement invariance across racial/ethnic group (e.g., across Hispanic, Black, or White families) for baseline assessments related to family functioning and adolescent problem behaviors. Korte et al. (2011a) completed a review of substance abuse outcome measures used in CTN studies including the use of urine drug screens (UDS), self-report, and corrected self-report measures. While most forms of substance abuse outcome measures were highly

Table 1
Key findings for Hispanic participants in each study.

Author(s) and date	CTN protocol # of study(ies) included	*N* (% Hispanic)	Finding theme (s)	Key findings for Hispanic participant in each study
Bamatter et al. (2010)	0021	379 (100%)	1, 3	• More chat associated with poorer retention. Chat not related to primary substance use abstinence
Brooks et al. (2013)	0001, 0002, 0004, 0005, 0006, 0007, 0021	2,063 (27%)	1, 2, 4	• Hispanics less likely than non-Hispanic Whites and Blacks to be female and have less education. Hispanics more likely than non-Hispanic Whites to have full-time employment, reside with their sexual partner, and endorse "other drug use" as primary • Hispanics reported lowest drug use severity and abuse history • Hispanics were more likely to report unprotected sex while trading sex, but were also less likely to report trading sex • Hispanics were found to have the highest total HIV drug risk score, although they were the least likely to report injection drug use • Unlike non-Hispanic Whites and non-Hispanic Blacks, an association between alcohol use severity and HIV sexual risk behavior was not found for Hispanics • After controlling for protocol differences and interactions, no race/ethnicity differences remained for drug use severity and psychiatric severity with HIV drug risk behavior in non-Hispanic Whites, non-Hispanic Blacks, and Hispanics
Brown et al. (2010)	0003	724 (10.1%)	1, 3	• Adjusted for sex and age, no differences found in past 30-day and lifetime heroin use as well as past 30-day use of other opioids between racial/ethnic groups (non-Hispanic Whites, Blacks, Hispanics, and other [Asians, American Indians]) • At induction, higher craving and withdrawal symptoms reported in Hispanics and non-Hispanic Whites compared to Blacks • After buprenorphine stabilization, no differences in craving and withdrawal symptoms between racial/ethnic groups • After 28-day stabilization, no differences between racial/ethnic groups in attrition and positive drug screens • Hispanics and non-Hispanic Whites reported more adverse events than Blacks • At end of stabilization period, lower doses of buprenorphine for Blacks compared to Hispanics and non-Hispanic Whites
Campbell et al. (2017)	0044	507 (10.8%)	1, 2, 3	• Fewer Hispanics and Blacks graduated high school • Hispanics and Blacks reported more travel time despite same distance as non-Hispanic Whites to site, less access to Internet, less likely to be employed, and less likely to have insurance • Hispanics reported more alcohol and cannabis as primary drug of abuse • Hispanics similarly benefited from treatments; additionally, no differences in treatment process outcomes (sessions and days attended) • Higher acceptability for TES in Hispanics and Blacks
Carroll et al. (2009)	0021	405 (100%)	1, 2, 3	• No differences in outcomes or retention between interventions, MET and CAU, in Spanish-speaking sample • High rates of retention and treatment completion across interventions • Moderate treatment differences favored MET in alcohol-as-primary-target subsample
Crits-Christoph et al. (2014)	0018, 0019	1,105 (6%)	1, 4	• Poorer performance in 5-session gender-specific skills intervention compared to 1-session intervention in Hispanics, with higher rates of unprotected sexual occasions after the 5-session intervention
de Dios et al. (2016)	0021	322 (100%)	1, 3	• Smoking at baseline related to SUD treatment outcomes: smokers less likely to achieve 30-day abstinence of both primary and all substances

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Table 1 (*continued*)

Author(s) and date	CTN protocol # of study(ies) included	*N* (% Hispanic)	Finding theme (s)	Key findings for Hispanic participant in each study
Feaster et al. (2010)	0014	480 (44.3%)	1	• Complete invariance across racial/ethnic group in BSFT data suggests valid comparisons possible across Hispanics, Blacks, and non-Hispanic Whites • Differences in intercept of family report of cohesion and functioning suggests Hispanic families would need a higher report of cohesion than Black and non-Hispanic White families to report equivalent family functioning • Residual variance in indicators of family functioning greatest for Hispanics, suggestive of least reliability when compared to Blacks and non-Hispanic Whites • Higher family functioning and less externalizing behaviors in Blacks compared to Hispanics and non-Hispanic Whites • Lower factor variances in Black families for externalizing parent report, externalizing adolescent report, and family functioning adolescent report, suggestive of more homogeneity in functioning and behaviors of Black families compared to Hispanic and non-Hispanic White families
Fish et al. (2015)	0021	338 (100%)	1, 3	• Three groups distinguishable by family conflict type: no/low conflict, pre-treatment conflict, and post-treatment conflict • SUD and alcohol outcomes best predicted by family conflict at post-treatment • Family conflict reduction during treatment associated with better drug and alcohol outcomes
Hser et al. (2017)	0050	795 (11.3%)	3	• Identified four trajectory groups in opioid use over a 55-month follow-up with Hispanics comprising: 20.9% of high use group, 11.0% of increasing group, 10.1% of decreasing group, and 6.6% of low use group • Hispanic race/ethnicity (relative to Black) associated with greater odds of membership in high use group
Kiluk et al. (2013)	0021	405 (100%)	1	• Excellent internal consistency for Spanish-translated revised version of SIP (SIP-RS) • SIPS-RS construct validity supported through correlations with composite scores from ASI and differential SIP-RS scores according to diagnostic criteria • SIP-RS associated with substance use and treatment retention: higher baseline scores associated with less abstinence during treatment and fewer days retained in treatment, the latter moderated by participants' legal status
Korte et al. (2011a)	0001, 0002, 0004, 0005, 0006, 0007, 0013	1,897 (16.1%)	1	• Three-way interaction between gender, ethnicity, and intervention group assignment, with non-Hispanic White women, Black women, and Hispanic men showing significant beneficial intervention effect
Korte et al. (2011b)	0001, 0002, 0004, 0005, 0006, 0007, 0009, 0010, 0013, 0014, 0015, 0017, 0018, 0019, 0020. 0021, 0027, 0028, 0029, 0030, 0031, 0032	11,449 (17.2%)	1	• No statistically significant differences in retention rates between racial/ethnic groups
Magruder et al. (2009)	0001, 0002, 0005, 0006, 0007, 0011	1,737 (12%)	1	• Greater odds of study retention in older Blacks and Whites (both Hispanic and non-Hispanic) than younger Blacks
McClure et al. (2017)	0053	296 (22%)		• Greater proportion of Hispanic participants in ACCENT compared to all national samples
Pagano et al. (2018)[a]	N/A	777 (18.5%)	2	• Hispanic smokers smoked fewer cigarettes per day (CPD) than non-Hispanic white smokers • Hispanic smokers were often nondaily smokers with higher number of quit attempts in past year • Hispanic smokers with less education and those who reporting opioids as their primary drug of use reported higher CPD • Hispanics in SUD treatment were at equally high risk of being current heavy smokers as compared to non-Hispanic Whites
Robbins et al. (2011)	0014	480 (44.3%)	1, 3	• Failure to engage in treatment less likely for Hispanics
Sanchez et al., 2015	0037	290 (11%)	1, 2	• More psychiatric disorders and depressive symptoms reported in Hispanics than in Blacks and non-Hispanic Whites • Hispanics more likely to have less education • Hispanic and Blacks more likely to use alcohol • Hispanics more likely than Blacks to be diagnosed with both a cocaine and other stimulant use disorder

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Table 1 (*continued*)

Author(s) and date	CTN protocol # of study(ies) included	*N* (% Hispanic)	Finding theme (s)	Key findings for Hispanic participant in each study
Sanchez et al., 2017	0037	297 (10%)	1, 2, 3	• Hispanics more likely to have a diagnosis of cocaine abuse or dependency than non-Hispanic Whites • Hispanics and non-Hispanic Whites more likely than Blacks to be diagnosed with a combined cocaine and other stimulant use disorder • Hispanics appeared to benefit from the exercise intervention, as demonstrated by the greatest difference in number of days of use between treatment groups, though findings were not significant.
Schulte et al. (2015)	0027	1,039 (11.7%)	2	• Compared to non-Hispanic Whites, Hispanics more likely to exhibit chronic HCV infection (HCV +/+) and a history of HCV infection but spontaneously cleared infection (HCV +/-). Compared to non-Hispanic Whites, Blacks more likely to exhibit HCV +/+ • Chronic HCV infection associated with being Hispanic and with older age
Shiu-Yee et al., 2018	0049	801 (11%)	2	• Being of Hispanic ethnicity associated with higher odds of membership in cocaine use class, (compared to minimal drug use class); higher odds of membership in substantial cocaine/heroin use class (compared to minimal drug use class)
Suarez-Morales et al. (2010)	0021	235 (100%)	1, 3	• Therapists' birthplace and acculturation level independently predicted days of substance use, but not treatment participation, for monolingual Spanish-speaking subsample
Walker et al. (2014)	0036	72 (100%)	1, 2	• Age of onset for cheese heroin = 13.5 years, age of daily use = 14.2 years • Majority (74%) reported a previous overdose
Wu et al., 2010	0001, 0002	343 (20.1%)	2, 4	• Higher levels of total HIV risk scores and risky injection drug use scores in Hispanics compared to Blacks • Higher level of unprotected sexual behaviors in Hispanics compared to non-Hispanic Whites • Hispanics more likely than non-Hispanic Whites to use heroin and tobacco • Lower likelihood of using cannabis and higher likelihood of better quality of life in Hispanics compared to non-Hispanic Whites

Note. Hispanic here refers to participants who either speak Spanish or are descended from Spanish-speaking countries, as well as participants who are or are descended from Latin American countries. Finding Themes: 1 = study engagement and assessment, 2 = obtained baseline sample/characteristics, 3 = substance use treatment outcomes, and 4 = HIV/risky sex behaviors. CTN protocol title: 001 = Buprenorphine/naloxone (Bu/Nx)versus clonidine for inpatient opiate detoxification; 002 = Buprenorphine/naloxone versus clonidine for outpatient opiate detoxification; 004 = MET to improve treatment engagement and outcome in subjects seeking treatment for substance abuse; 005 = Motivational interviewing to improve treatment engagement and outcome in outpatient substance users; 006 = Motivational incentives for enhanced recovery in stimulant users in drug free clinics; 007 = Motivational incentives for enhanced recovery in stimulant users in methadone maintenance clinics; 0009 = Smoking cessation treatment with transdermal nicotine replacement therapy; 0010 = Bu/Nx facilitated rehabilitation for heroin addicted adolescents/young adults; 0011 = Feasibility study of a telephone enhancement procedure to improve participation in continuing care activities; 0013 = MET to improve treatment utilization and outcome in pregnant substance users; 0014 = Brief Strategic Family Therapy for adolescent drug abusers; 0015 = Women's treatment for trauma and substance use disorders; 0017 = HIV and HCV intervention in drug treatment settings; 0018 = Reducing HIV/STD risk behaviors: A research study for men in drug abuse treatment; 0019 = Reducing HIV/STD risk behaviors: A research study for women in drug abuse treatment; 0020 = Job-seekers training for patients with drug dependence; 0021 = MET to improve treatment engagement and outcome for Spanish- speaking individuals seeking treatment for substance abuse; 0027 = Starting treatment with agonist replacement therapies (START) study; 0028 = Randomized controlled trial of osmotic-release methylphenidate (OROS-MPH) for attention deficit hyperactivity disorder (ADHD) in adolescents with substance use disorders; 0029 = Pilot study of OROS-MPH in initiating and maintaining abstinence in smokers with ADHD; 0030 = Prescription opioid addiction treatment study; 0031 = Stimulant abuser groups to engage in 12-step: Evaluation of a combined individual-group intervention to reduce stimulant and other drug use by increasing 12-step involvement; 0032 = HIV rapid testing and counseling in drug abuse treatment programs in the U.S.; 0036 = Epidemiology and ethnographic survey of "cheese" heroin use among Hispanics in Dallas County, Texas; 0037 = Stimulant reduction intervention using dosed exercise; 0044 = Web-delivery of evidence-based, psychosocial treatment for substance use disorders; 0049 = Project HOPE: Hospital visit as opportunity for prevention and engagement for HIV-infected drug users; 0050 = START follow-up study; 0053 = Extended-release naltrexone vs. buprenorphine for opioid treatment.

Abbreviations: ASI = Addiction Severity Index; BSFT = Brief Strategic Family Therapy; CTN = Clinical Trials Network; MET = Motivational Enhancement Treatment; SIP = Short Inventory of Problems; SUD = substance use disorder; TAU = treatment as usual; TES = Therapeutic Education System.

[a] Study used the term "Latinos".

correlated, some measures statistically advantaged non-Hispanic White women, Black women, and Hispanic men which could lead to erroneous conclusions concerning the efficacy of an intervention with these groups.

Few studies addressed the issue of language among participants. The Carroll et al. (2009) study, in which all the participants were Spanish-speakers, was the only study that specifically addressed the language of the assessment materials. Some studies explicitly stated that speaking English was an inclusion criterion (n = 4), including one entirely Hispanic sample (Walker et al., 2014), while the rest had no mention of language inclusion/exclusion criteria. One study in the review tested the psychometric properties of the Spanish-translated revised version of the Short Inventory of Problems (SIP-RS) and found the SIP-RS to be a reliable and valid assessment of adverse consequences associated with alcohol and drug use (Kiluk, Dreifuss, Weiss, Horigian, & Carroll, 2013).

3.3. Obtained baseline sample characteristics

3.3.1 Participant demographics

Among the studies that reported baseline characteristics of their samples by race/ethnicity category, four studies found that Hispanics who use substances were less educated compared to other groups (Brooks et al., 2013; Campbell et al., 2017; Pagano, Gubner, Le, & Guydish, 2018; Sanchez et al., 2015). In a study including seven CTN protocols, Brooks et al. (2013) found Hispanics were less likely to be female (12.9% of Hispanic sample was female compared to 42.0% for non-Hispanic Blacks and 45.2% for non-Hispanic Whites). However, findings from other studies suggest that these results may be trial dependent with Campbell et al. (2017) reporting lower female participation for Hispanics than non-Hispanic Blacks and non-Hispanic Whites while Sanchez et al. (2015) found that the Hispanic group had the highest percentage of female participation. Likewise, Campbell et al. (2017) found that Hispanics were less likely to be currently employed compared to non-Hispanic whites, while Brooks et al. (2013) found Hispanics were more likely to have full-time employment. Compared to non-Hispanic Whites, Hispanics were also more likely to reside with a sexual partner and report better quality of life in vitality and emotional well-being (Brooks et al., 2013; Wu et al., 2010). In terms of access to treatment issues, one study found that compared to Whites, Hispanics reported more travel time to the site (despite reporting the same distance), less access to the internet, and were less likely to have insurance (Campbell et al., 2017).

3.3.2 Drug use

Results of the CTN studies found high rates of alcohol use among Hispanics. In the Carroll et al. (2009) study that was comprised of Hispanic adults (all Spanish-speaking), alcohol was the primary substance used by 60% of the participants. Among the pooled analyses, alcohol, marijuana, and “other” substances were the most commonly endorsed primary substance of abuse among Hispanics in CTN trials (Brooks et al., 2013; Campbell et al., 2017). Additionally, higher alcohol use was found among Hispanic adults with stimulant use disorders in residential treatment compared to their non-Hispanic White counterparts (Sanchez et al., 2015).

Several studies found differences in drug use between Hispanics and other racial/ethnic groups. Compared to Whites, Hispanics in CTN-affiliated treatment programs reported higher rates of stimulants, cannabis and “other” drugs and lower rates of alcohol and opioids as the primary substance for which they were receiving treatment (Pagano et al., 2018). Hispanics also tended to report lower drug use severity and abuse history overall compared to non-Hispanic White and non-Hispanic Black groups (Brooks et al., 2013). Among people living with HIV who use substances, being Hispanic was associated with greater odds of being in a group associated with cocaine use and substantial cocaine/heroin use compared to minimal drug use (Shiu-Yee et al., 2018).

In studies focusing on adults with stimulant use disorders, specifically, Hispanics were more likely than Whites to be diagnosed with cocaine abuse or dependence and more likely than Blacks to be diagnosed with both cocaine and other stimulant use disorder (Sanchez et al., 2015; Sanchez et al., 2017). When examining adult opiate users, Brown et al. (2010) found no racial/ethnic group differences for lifetime use and past 30 day use of heroin as well as past 30 day use of other opiates; however, Hispanics reported higher cravings and withdrawal symptoms at buprenorphine-naloxone induction than Blacks. Among adolescent opiate users in treatment, Walker et al. (2014) found that Hispanic participants reported an average age of first use of 13.5 years and daily use at 14.2 years, with a majority (74%) reporting a previous overdose.

Finally, tobacco use was high among Hispanics in substance use treatment. Wu et al. (2010) reported that 91.3% of Hispanic adults in opioid detoxification treatment were using nicotine/tobacco while Sanchez et al. (2015) reported that 87.1% of Hispanic adults in residential treatment for stimulant use disorders were using cigarettes/other tobacco. However, in their study on cigarette smoking and quitting behaviors among Hispanics in SUD treatment, Pagano et al. (2018) found that, compared to non-Hispanic white smokers in SUD treatment, Hispanics smoked fewer cigarettes per day, were more likely to report a quit attempt in the past year, and reported higher numbers of past-year quit attempts. Among Hispanic smokers, those with less education and those reporting opioids as their primary drug of use reported more cigarettes per day.

3.3.3 Comorbidities

Few studies described the prevalence of comorbidities among Hispanic substance users. In one study examining adults with stimulant use disorders in residential treatment, Sanchez et al. (2015) reported that Hispanics and Whites reported more psychiatric disorders and depressive symptoms and fewer comorbid medical conditions than Blacks. In another study, Schulte et al. (2015) examined risk factors associated with HCV among opioid-dependent patients in medication-assisted therapy and found that compared to Whites, Hispanics were more likely to have a chronic virus infection and a history of HCV infection.

3.4. Substance use treatment outcomes

3.4.1 Behavioral interventions

Treatment outcomes among Hispanics centered primarily around findings from behavioral interventions. Only one study was comprised completely of Hispanic participants, which was a multisite randomized trial comparing the effectiveness of three individual sessions of MET to three individual counseling as usual (CAU) sessions among Spanish-speakers seeking treatment for substance use (Carroll et al., 2009). Researchers found that both groups demonstrated reductions in substance use and high treatment completion rates. However, moderate treatment differences favoring MET were found in the subsample of participants whose primary substance use problem was alcohol (Carroll et al., 2009).

Several studies also used data from the Carroll et al. (2009) MET trial to conduct secondary analyses related to participant outcomes. Suarez-Morales et al. (2010) found that therapists’ birthplace and level of acculturation independently predicted decreased client substance use during treatment. On the other hand, cultural match (birthplace and level of acculturation) between therapists and their clients did not predict treatment participation or days of substance use among clients. Bamatter et al. (2010) found that informal discussion in Spanish-speaking treatment sessions had significant inverse correlations with participant motivation to reduce substance use and retention in treatment. Fish et al. (2015) found that increased family conflict was associated with greater post-treatment alcohol and drug use while reduced family conflict was associated with less alcohol and drug use among the

Spanish-speaking families. Finally, in the Carroll et al. (2009) study, smoking was also associated with having a reduced likelihood of 30-day abstinence of both primary and all substances (de Dios et al., 2016).

Among the remaining studies that did not use data from the Carroll et al. (2009) trial, three studies demonstrated improved substance use treatment outcomes for Hispanic participants in trials utilizing other behavioral interventions. Brief Strategic Family Therapy (BSFT) for substance using adolescents was found to be significantly more effective overall than treatment as usual (TAU) in engaging and retaining participants; however, Hispanics in the trial were more likely to engage in treatment compared to Whites (Robbins et al., 2011). Similarly, Campbell et al. (2017) found that for an internet-delivered Therapeutic Education System (TES) intervention, Hispanic adults reported higher acceptability of the TES intervention compared to Whites. Hispanic adults with stimulant use disorders also benefited from a dosed exercise intervention; however, White participants had significantly lower number of days of use when the model was adjusted to provide an unbiased estimate of the exercise effect had all participants been adherent (Sanchez et al., 2017).

3.4.2 Pharmacotherapy

Only two studies reported findings among Hispanics for pharmacotherapy trials. Brown et al. (2010) examined racial/ethnic differences before and during stabilization with buprenorphine-naloxone for opioid users and found that following the 28-day stabilization phase, there were no significant between-group differences for withdrawal and craving symptoms, positive drug screens, and attrition. However, Hispanic and White participants reported more adverse events during stabilization and slightly higher mean dose levels of buprenorphine compared to Black participants. In a different study examining opioid use trajectories over a 55-month follow-up period for participants randomized to methadone or buprenorphine-naloxone, Hser et al. (2017) found identifying as Hispanic (relative to Black) was associated with greater odds of being in the high use group (relative to the low use, odds ratio [OR] 3.21), with high and increasing use groups showing worse outcomes in drug use, employment, legal, social/family relationships, and mental health functioning.

3.5. HIV/Risky sex behavior outcomes

Three CTN studies provided findings specific to HIV/risky sex behaviors among Hispanic substance users. First, in a diverse sample of opioid-dependent inpatients and outpatients enrolled in two multi-site CTN studies assessing the effectiveness of buprenorphine-naloxone and clonidine for opioid detoxification, Wu et al. (2010) used baseline data to assess gender and racial/ethnic differences in addiction severity, HIV risk, and quality of life. Hispanics exhibited higher scores on HIV risk, risky injection drug use, and had higher levels of unprotected sexual behaviors. Second, Brooks et al. (2013) found that while Hispanic individuals were less likely to report trading sex relative to their non-Hispanic Black or non-Hispanic White counterparts, they were more likely to report having unprotected sex while trading sex. In comparison to non-Hispanic Blacks and non-Hispanic Whites, Hispanic participants were found to have the highest total HIV drug risk score, despite a lower likelihood of self-reported injection drug use. Lastly, in data pooled from two parallel randomized CTN trials comparing the effectiveness of a single-session HIV education group to a 5-session gender-specific skills intervention group in reducing the rates of unprotected sex, Hispanic participants demonstrated poorer response to the 5-session intervention relative to the 1-session intervention (Crits-Christoph et al., 2014).

4. Discussion

We identified several baseline characteristics of Hispanic participants in CTN studies such as lower employment rates, less likelihood of having insurance, lower rates of internet access, and increased travel time to SUD services, which interfere with treatment initiation and engagement and have demonstrated implications for treatment access (Guerrero et al., 2013; Mennis & Stahler, 2016; Saloner & Lê Cook, 2013). Other baseline characteristics of Hispanics in the CTN studies confirm the presence of barriers found to contribute to significant disparities in treatment completion (Lê Cook & Alegría, 2011; Mennis & Stahler, 2016) including homelessness, limited health literacy, geographic inaccessibility, citizenship status, level of acculturation, and duration of residence in the U.S. Fundamentally, the studies conducted in the CTN over the past twenty years, while improving the inclusion of minorities in clinical trials, have struggled with many of the fundamental structural barriers which perpetuate disparities in treatment access and completion for Hispanic populations.

We also identified treatment issues related to co-occurring disorders and risky sexual practices among Hispanics, high rates of alcohol and tobacco use among Hispanics entering treatment, and early age of initiation of drug use among Hispanic youth which have important clinical implications. CTN studies have contributed to the identification of several effective behavioral interventions for adults (TES, dosed exercise) and adolescents (BSFT). However, the effectiveness of these interventions may be limited to specific factors such as alcohol use (MET; Carroll et al., 2009) or cultural match (Suarez-Morales et al., 2010). The prevalence of comorbidities among Hispanics suggests the need for integrated assessments and treatment for substance use and co-occurring disorders in settings serving Hispanic populations. Finally, given the high rate of alcohol use disorder (AUD) as primary SUD diagnosis among Hispanics (e.g., Brooks et al., 2013; Campbell et al., 2017; Carroll et al., 2009; Sanchez et al., 2015), pharmacotherapies such as naltrexone should be considered.

Our review has several limitations. First, limiting this review to the CTN resulted in a small number of studies, potentially excluding other studies relevant to Hispanic populations in substance abuse treatment. This lack of data on Hispanics was not unexpected. Second, although important information has been gained through CTN research on Hispanic populations, it is difficult to draw definitive conclusions because many of the findings reported were based on a single study. Further, only one study (Carroll et al., 2009) examined substance use outcomes among Hispanics as their primary objective. Third, results reported in the review are based on published studies, many of which were secondary analyses of existing data from studies that were not designed nor powered to examine ethnic differences, which limited the questions that could be answered and the constructs that could be investigated.

Additional research within the CTN should examine measurement equivalence of baseline assessments and substance abuse outcomes measures across racial/ethnic groups, which will increase our confidence that we are investigating the construct of interest in Hispanic participants and drawing accurate conclusions regarding the efficacy of interventions. Continued research aimed at improving our understanding of substance use and related conditions and effective treatments for Hispanic populations should consider cultural and historical experiences of different groups and how patient characteristics influence utilization of services. Certainly, substance use treatment may be improved for Hispanic individuals through the development of culturally-tailored treatment programs.

5. Conclusion

The studies conducted in the CTN over the past twenty years, while improving the inclusion of minorities in clinical trials, have struggled with many of the fundamental structural barriers which perpetuate disparities in treatment access and completion for Hispanic populations. Although information has been gained from CTN studies, there remains an underrepresentation of Hispanic populations overall. This is consistent with the lack of recruitment of people of color into clinical

trials and has implications for establishing effective treatment for subpopulations. More studies are needed that examine the impact of structural factors that act as barriers to treatment access and engagement and result in significant disparities in treatment outcomes.

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