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Occupation-Based Intervention for Addictive Disorders: A Systematic Review



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ABSTRACT

Addictive disorders disrupt individuals' occupational lives, suggesting that occupational therapists can play a crucial role in addiction rehabilitation. Occupation-based interventions are those in which an occupation is performed, and occupations are defined as those activities a person engages in to structure time and create meaning in one's life. This review asked: In persons with addictive disorders, are occupation-based interventions more effective than treatment as usual in improving short and long-term recovery outcomes? A systematic literature search was performed by a medical librarian in Ovid MEDLINE, PsychINFO, Social Work Abstracts, OTSeeker, HealthSTAR, CINAHL, and ACPJournalClub. Authors screened 1095 articles for inclusion criteria (prospective outcome studies examining the effectiveness of an occupation-based intervention with a sample primarily consisting of a diagnosis of a substance-related or addictive disorder and with at least five participants), and two authors appraised the resulting 66 articles using a standard appraisal tool, yielding 26 articles for qualitative synthesis and 8 with shared outcome measures for quantitative analysis. Occupation-based interventions in the areas of work, leisure, and social participation were found to have been used to treat addictive disorders. Occupation-based interventions in the area of social participation all elicited better outcomes than their respective control/comparison groups. Not all occupation-based interventions in the area of leisure elicited better outcomes than their comparison group, but in the eight articles with shared outcome measures, quantitative analysis demonstrated leisure interventions produced larger effect sizes than social participation interventions.

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1. Introduction

Addictive disorders disrupt individuals' occupational lives (American Psychiatric Association, 2013), suggesting that occupational therapists can play a crucial role in addiction rehabilitation. However, literature on the effectiveness of occupation-based interventions – which are central to occupational therapy practice – is limited. In this paper we define an occupation-based intervention as an intervention in which an occupation is performed. Occupations here are understood not just as employed work or vocation. More broadly, occupations have been defined in the fields of occupational science and occupational therapy as those things that human beings do to occupy themselves within various contexts (Townsend, 1997), as goal-directed activities that are self-directed and self-initiated over time and within specific environments (Yerxa, 2000), and as constructs that give meaning to life, organize behavior, shape and are shaped by environments, develop and change over a lifetime and describe who a person is and how

they feel about themselves (Canadian Association of Occupational Therapists, 2014).

Occupation-based interventions, defined here as those in which an occupation is performed, can be contrasted with more didactic interventions in which a form of skill training, for example, is provided, but *performance* of the actual occupation does not take place. Occupation-based interventions as defined in this study are not always used by occupational therapists. While occupational therapy's conceptual foundations advocate the use of occupational performance to facilitate holistic wellness, the discipline has seen a persisting shift away from the use of occupations as interventions and a move toward more reductionist treatment of components of dysfunction (Gray, 1998). In Gray's words, more commonly "clients' underlying problems are identified and therapists select exercises specifically geared toward improving strength, range of motion, coordination, visual perception, problem solving, balance, attention, and so forth" (p. 355). Thus while interventions in occupational therapy often aim toward restoring occupational participation, they no longer necessarily consist of occupation-based interventions and instead often focus on splinting, stretching, exercising, or adapting local elements of dysfunction. Systematic study of the effectiveness of occupation-based interventions may facilitate a return to more occupation-based practice within occupational therapy.

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Seven areas of occupation have been defined in occupational therapy, and include: rest/sleep, education, work, leisure, social participation, activities of daily living (ADL), and instrumental activities of daily living (IADL) (American Occupational Therapy Association, 2014). Although all of the areas of occupation may be used by occupational therapists in all kinds of settings depending on circumstances and client needs, ADL (such as bathing, dressing, and toileting) and IADL (such as community mobility and money management) are by far the most commonly used, particularly in inpatient and rehabilitation settings due to occupational therapists' primary role in safe discharge planning in these settings. In mental health settings (both inpatient and outpatient), occupation-based interventions in the areas of leisure, work, education, and social participation are more common (American Occupational Therapy Association, 2014).

As suggested above, occupational therapists may play a crucial role in the rehabilitation of persons with addictive disorders, and have "the skills necessary to address deficits in occupational performance [and] promote development of healthy performance patterns and environmental contexts that support abstinence or the reduction of alcohol and drug use" (Thompson, 2007, p. 65). However, occupational therapists are rarely part of addiction treatment service teams, and studies have shown that many occupational therapists do not screen for addictive disorders and report feeling unprepared to work with this population (Thompson, 2007). While occupational therapists working in mental health settings have reportedly been more likely to assess clients for substance use disorders than those working in other settings (the latter have been reported to do so less than five percent of the time) (Thompson, 2007), the prevalence of occupational therapists working in mental health settings has steadily declined. Literature suggests around 27 to 30 percent of all occupational therapists work in mental health settings (Sweeney & Nichols, 1996; Thompson, 2007) as opposed to during its founding years when occupational therapy was primarily used in sanatoriums (Schwartz, 2003). Thus the overall frequency with which occupational therapists screen for and treat addictive disorders is low. This is unsettling because occupational therapists are likely to encounter clients with substance use disorders considering the many practice settings in which they work (such as acute hospital care, nursing homes and rehabilitation facilities) where frequency of admission is impacted by substance use disorders (Atkinson, 1973).

To better provide occupational therapists with supporting scientific evidence for the treatment of clients with addictive disorders that allows them to capitalize on their unique skills and tools, more research is needed on the effectiveness of occupation-based interventions. The objectives of this review, therefore, were to 1) assess evidence of the effectiveness of occupation-based interventions for addictive disorders and 2) identify the primary areas of occupation that are being implemented as occupation-based interventions for addictive disorders. This systematic review is unique in that it examines the effectiveness of occupation as an intervention for addiction; it is the first to compare occupational therapists' main intervention tool (occupation) with other established practices.

No systematic review has specifically addressed the effectiveness of *occupation-based interventions* for persons with addictive disorders. In the field of occupational therapy, Stoffel and Moyers (2004) reviewed literature on the effectiveness of interventions for addictive disorders (from multiple disciplines) and suggested ways in which occupational therapists may adopt these evidence-based interventions in their practice. Their review found 12-step facilitation, motivational approaches, cognitive behavioral therapy, and brief interventions to be the most effective for addictive disorders and, on the basis of these findings, the authors suggested that occupational therapists incorporate these evidence-based approaches into practice by tailoring them to facilitate occupational participation. Other reviews (e.g. Bart, 2012) have documented the effectiveness of pharmacological interventions for substance use disorders, noting improved outcomes when these are

bolstered with other evidence-based approaches such as those noted in Stoffel and Moyers' review. Finally, Brown (2012) systematically reviewed occupational therapy interventions for adults with serious mental illness (Brown, 2012), but not specifically for persons with addictive disorders.

Occupational therapy has a unique tool – occupation-based intervention – that may be particularly effective for addressing addictive disorders (Gutman, 2006; Wasmuth et al., 2015), but is left without systematic investigation in the context of addiction treatment, even by those studies emerging in occupational therapy journals and/or from within the field of occupational therapy. As a result, little research has synthesized evidence supporting various occupation-based intervention approaches, making it difficult for occupational therapists to implement evidence-based practice for addictive disorders using occupation-based interventions. The current systematic review therefore addresses this gap by examining and synthesizing findings from studies of occupation-based interventions for addictive disorders.

It is critical to emphasize the distinction this review proposes between occupational therapy and occupation-based interventions. While occupation-based interventions – interventions in which an occupation is performed – are rooted in occupational therapy theory and can be implemented by occupational therapists, the term occupation-based intervention as it is defined in this manuscript is not restricted to the domain of occupational therapy. Occupation-based interventions may appear in a number of different disciplines including art therapy, music therapy, vocational therapy, drama therapy, and a number of other professions. Furthermore, as noted above, all occupational therapy interventions are not occupation-based interventions. Occupation-based interventions are only a subset of interventions used by occupational therapists. Other interventions used by occupational therapists may include (and this list is by no means exhaustive) skills training, physical modalities such as the use of ultrasound, splinting of upper extremities, and biomechanical interventions to maximize function. Finally, some occupational therapists may define occupation-based interventions differently than the term is defined in this manuscript. For instance, some have used the term 'occupation-based' to indicate that an intervention is intimately related to a person's occupational goals. Using this definition, splinting a client's wrist to assist with the ability to perform a desired occupation such as painting would fall within the definition of being an occupation-based intervention. *By contrast, the present manuscript defines occupation-based interventions only as those in which an occupation is performed.* Adopting this definition, *painting* with the splint on would be an occupation-based intervention. Importantly, the occupation-based intervention of painting may be administered by (for example) an art therapist or recreational therapist; the professional administering the intervention is not a defining factor in terms of whether the intervention is considered to be occupation-based, according to this review. The defining factor is that the intervention involves performance of an occupation.

This distinction synthesizes interventions from a number of disciplines on the basis that they are occupation-based, making it possible to study the effectiveness of interventions that involve performance of occupations versus those that do not. The rationale for drawing this distinction stems from literature suggesting that in treating addictive disorders, there may be reason to believe that putting skills/actions/occupations to use in real time may bolster outcomes and/or be more effective than interventions that teach skills to be put to use at some time in the future (Gutman, 2006; Wasmuth et al., 2015). In short, promoting changed behaviors in persons with addictive disorders may best be brought about through performing new occupations – i.e. through occupation-based intervention.

1.1. Background

Persons new to addiction recovery often lack many meaningful occupations – that is, they experience occupational deficit – because

their addiction(s) have taken precedent over participation in other occupations (American Psychiatric Association, 2013). Many studies have noted correlations between occupational deficit and addictive behavior (see Alexander, 2008), and some have gone as far as to suggest that addiction, itself, becomes an occupation (Kiepek & Magalhães, 2011; Sackman, Sackman, & DeAngelis, 1978; Wasmuth, Crabtree, & Scott, 2014). Conversely, others have found that participation in occupations bolsters treatment success and that absence of new occupations in recovery is linked to higher relapse rates (Correia, Benson, & Carey, 2005).

Occupations have been identified as critical in structuring time, experiencing motivation and enjoyment, interacting with others, and developing one's identity, routines, roles, and habits. Thus occupational deficit, understood as a lack of participation in occupations, may preclude motivation and opportunities for social interaction, enjoyment, temporal structure, and a positive self-identity with corresponding roles, habits, and routines (Kielhofner, 2008), all of which may impact addiction severity. Hence, the correlations between occupational deficit and ongoing addictive behavior are intuitive.

Furthermore, research has shown that persons with addictions perform poorly on tests of metacognitive mastery, which is defined as the ability to use metacognitive knowledge (understanding of one's own thoughts and the thoughts of others) to respond to day-to-day individual and interpersonal challenges (Lysaker et al., 2014). It has been posited that this poor metacognitive mastery contributes to occupational deficit in persons with addictive disorders (Wasmuth et al., 2015). Literature has linked mastery, self-efficacy, and effective recovery efforts among persons with addictive disorders. For example, Litt, Kadden, Kabela, and Petry (2008) found that in marijuana dependence recovery, long-term abstinence is predicted by good self-efficacy which in turn, is facilitated when people have many opportunities to experience mastery. When individuals do not regularly participate in meaningful occupations, self-efficacy and mastery experiences are limited (Kielhofner, 2008), impacting addictive behavior and recovery outcomes.

Didactic interventions – interventions that involve skills training or some other element of instruction – may be helpful for learning new strategies to use in addiction recovery, but evidence suggests that putting newly learned skills into practice is a challenge for this population. For example, research has suggested that clients often struggle to implement the interpersonal skills and tools learned in cognitive behavior therapy groups to real-life scenarios (Blagys & Hilsenroth, 2002). By contrast, occupation-based interventions require individuals to put their skills to use in the moment – they are faced with real-time challenges in which they have the opportunity to actively respond with newly learned skills. By doing so, occupation-based interventions provide individuals with mastery experiences that can, in turn, improve their self-efficacy. Thus, supplementing CBT and other didactic interventions with occupation-based approaches may facilitate better addiction recovery outcomes.

1.2. Research questions

This systematic review examines the following primary research question: In persons with addictive disorders, are occupation-based interventions more effective than treatment as usual in improving short and long-term recovery outcomes? In addition, this review addresses a number of other secondary questions including the following: what occupation-based interventions have been used to treat addictive disorders? What kinds of addictions are treated with occupation-based interventions, and are certain types of occupation used for certain kinds of addiction? What kinds of outcomes (e.g. substance use, quality of life, perceived self-efficacy) are examined? What didactic and/or other treatments are occupation-based interventions being compared to? Which of the seven areas of occupation are most common in addiction intervention? Are some areas of occupation more effective than others in addressing substance use and/or other recovery-related outcomes? The results of this study will provide knowledge of the evidence (or

lack thereof) of occupation-based interventions for addictive disorders that is currently unavailable to occupational therapists working in mental health settings as well as in the many other settings in which addiction appears, often as a co-morbid condition.

2. Methods

2.1. Procedures

While occupation-based practice and occupation-based interventions are central to occupational therapy's domain and process (American Occupational Therapy Association, 2014), the concept of occupation-based intervention is not salient in mental health and addiction literature. Therefore, a comprehensive review of the effectiveness of occupation-based interventions required innovation and creativity to develop an effective search strategy and method for synthesizing the broad range of data collected.

In collaboration with a medical librarian (third author), the first author performed an initial search on Ovid MEDLINE using 'occupational therapy' AND 'addiction'. 'Addiction' yielded a number of substance-specific headings as well as two more general headings – 'substance related disorders' and 'addictive behavior'. For the purpose of this review, the two more general headings were used in combination with 'occupational therapy' as follows: 'substance related disorders' OR 'addictive behavior' AND 'occupational therapy'. However, many disciplines can (and do) use occupation-based interventions in the context of addiction rehabilitation. Therefore, the authors and medical librarian examined MESH term trees in Ovid MEDLINE and identified all keywords that could potentially elicit studies of interventions encompassing the performance of occupations. These keywords were added to the search, yielding the following strategy: social participation/or art therapy/or dance therapy/or exercise therapy/or music therapy/or occupational therapy/or recreation therapy/or mind-body therapies/or psychodrama/or tai ji/or yoga/AND behavior, addictive/or substance-related disorders.

The first author then consulted with a group of four fellows of the American Occupational Therapy Association¹ and a former mental health occupational therapist who is now an occupational therapy professor specializing in occupational therapy and mental health.² This consultation was to ensure the unlikelihood that the determined strategy would miss relevant studies. After this consultation, the medical librarian performed this search strategy in Ovid MEDLINE, PsychINFO, Social Work Abstracts, OTSeeker, HealthSTAR, CINAHL, and ACPJournalClub. This search yielded 1088 articles. Eleven additional articles were identified through other sources including Google Scholar and citations from original articles. After removing duplicates, 1095 articles were screened by the first and second author who independently read each abstract to determine eligibility. When authors disagreed about eligibility, the full text articles were examined for inclusion/exclusion criteria and a final consensus decision was reached for each.

2.2. Inclusion/exclusion criteria

Prospective outcome studies (evidence levels 1, 2, and 3) with a sample of persons with addictive disorders of $N \geq 5$ that examined the effectiveness of an occupation-based intervention (again, this was defined as an intervention that encompassed occupational performance) were initially included based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati,

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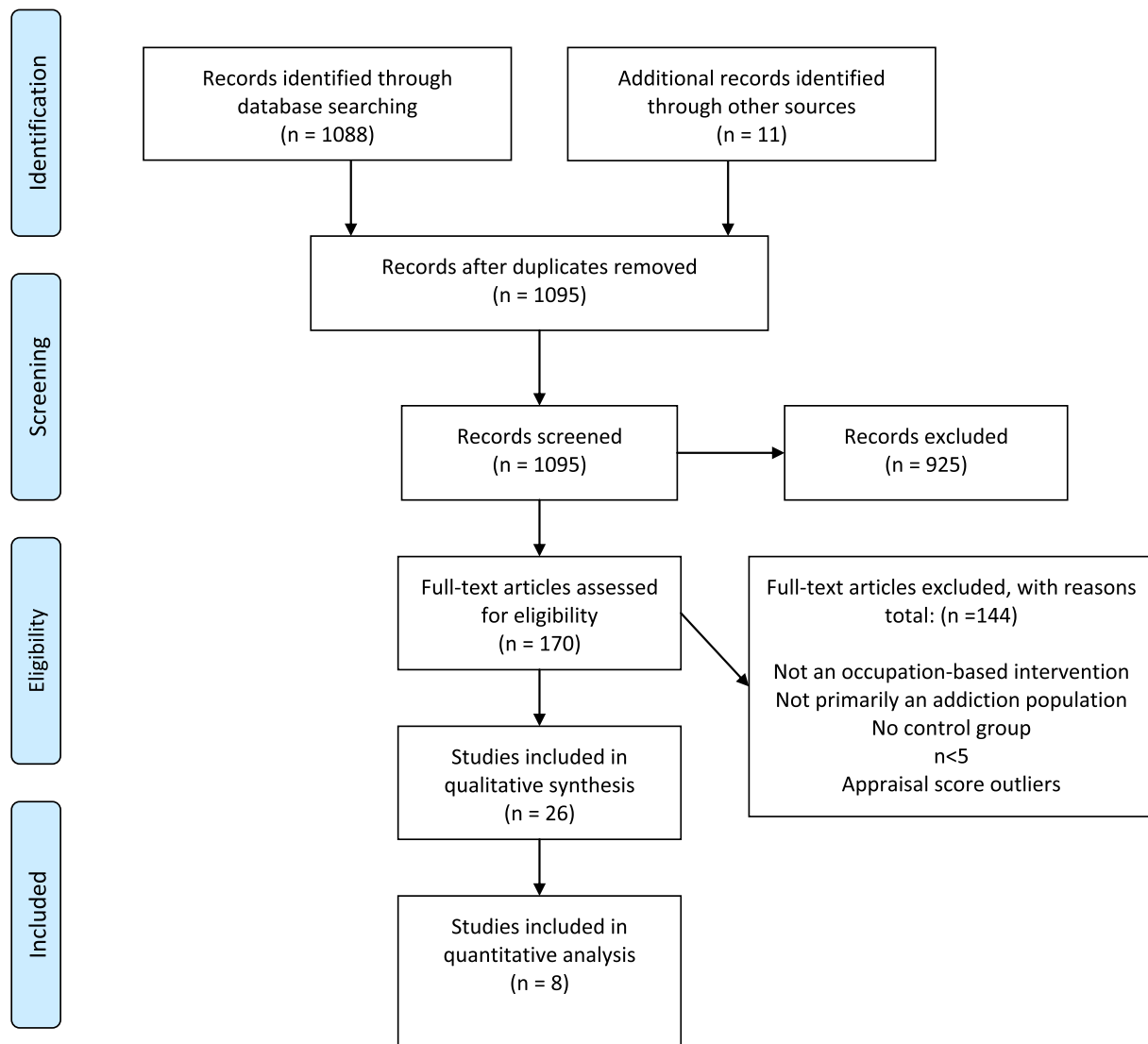


Fig. 1. Prisma flow chart demonstrating search results and article selection.

Tetzlaff, Altman, & Group P, 2010). Studies examining didactic interventions without an activity component were excluded, as this study specifically sought to uncover differences of effectiveness between interventions that included performance of occupations rather than those that involved training on *how* to perform a specific skill or occupation or subcomponents of a task. This process yielded 66 studies to be included in qualitative synthesis and potential quantitative meta-analysis.

The first and second authors then independently appraised each full text article using MacDermid's (2004) standards for occupational therapy research. After individually appraising each item for each full text article, the authors followed MacDermid's suggested consensus process. Level of evidence was recorded and data on substance use and recovery/quality of life outcomes were extracted for literature synthesis. To maximize the validity of reported results, analysis of variance was performed on MacDermid appraisal scores of all articles included at this stage of the research. Outliers (studies whose appraisal score fell more than two standard deviations below the mean) were then excluded from final analyses ($M = 27.45$, $SD = 8.22$). The authors ensured methodological rigor by including only randomized control and quasi-controlled studies in final analyses. This yielded a total of 26 studies included in qualitative analysis, 8 of which were included in quantitative analysis of effect sizes for two outcome measures as discussed below.

3. Results

Results of the identification, screening, eligibility determination and final inclusion of articles can be seen in Fig. 1.

This study was exploratory and therefore cast a wide net to collect an array of data on the effectiveness of occupation-based interventions for addictive disorders. Much variation can be seen not only in types of occupation-based interventions, but also in control groups and/or treatment comparisons, population and sample size, type of addiction, duration of addiction, duration of intervention, and target outcomes.

Because the distinction between occupation-based interventions (as defined in this manuscript) and other interventions is not salient in existing literature but rather was introduced by the authors of this review, findings from the systematic literature search did not neatly divide into occupation-based versus non-occupation-based interventions. Thus, some studies compared one occupation-based intervention to another, and in other cases the authors of this review had to deliberate and reach consensus about whether or not an intervention was occupation-based according to the proposed definition. As with many conceptual distinctions, there was gray area and room for further reflection and debate regarding decisions. The distinctions made served the heuristic purpose of comparing outcomes of occupation-based and non-occupation-based interventions. Findings are organized below by research question.

Table 1
Occupation-based controlled studies for addictive disorders.

Study (population)	n	Study Type	Addiction	Duration/dose	Intervention (setting)	Area of Occupation	Comparison	Time of diff
Significant between-group differences								
Albornoz (<i>adol/adult w/depression</i>)	n = 24	RCT	SUD	12/-	music (OP-Spanish)	leisure	TAU	3 mo
Daniel et al. (<i>sedentary smokers</i>)	n = 40	QC	Nicotine	1/10	exercise bike (OP)	leisure	cognitive distraction	during
Ermalinski et al. (<i>male veterans</i>)	n = 90	QC	Alcohol	30/150	yoga (IP)	leisure	psychotherapy	1.5 mo
*James (<i>adol</i>)	n = 60	QC	SUD	4/60	music (IP rehab)	leisure	OT crafts group	<1 mo
Kashner et al. (<i>homeless veterans</i>)	n = 142	RCT	SUD	1 year	work therapy (OP)	work	control group	12 mo
Li et al. (2013) (<i>female</i>)	n = 70	QC	Heroin	90/80	tai chi (OP)	leisure	control group	6 mo
Li et al. (2002) (<i>male</i>)	n = 86	QC	Heroin	50/30	qigong (OP)	leisure	med & non-med control	3 mo
Moran et al. (<i>veteran males</i>)	n = 56	QC	Alcohol	9/60	SRAT (IP rehab)	leisure	TAU	<1 mo
Rigter et al. (<i>adol</i>)	n = 450	RCT	Marijuana	48/-	MDFT (OP)	social partic.	individual psychotherapy	12 mo
Rowe et al. (<i>dual-diag adults</i>)	n = 114	QC	SUD	16/60	peer support, etc. (OP)	social partic.	TAU & jail diversion	12 mo
Sacks et al. (<i>female offenders</i>)	n = 468	RCT	SUD	120/240	TC (pre-parole)	social partic.	cognitive behavioral	12 mo
Scerbo et al. (<i>adults</i>)	n = 18	QC	Nicotine	1/15	exercise-jogging (OP)	leisure	walking & passive control	15 min
Slesnick et al. (<i>adol</i>)	n = 179	RCT	SUD	4-14/-	MI, CRA, EBFT (shelter)	social partic.	TAU	24 min
Smelson et al. (<i>dual-diag adults</i>)	n = 102	RCT	SUD	40/60	TLCC (OP-recent psych IP)	social partic.	health education control	6 mo
Taylor et al. (<i>pre-AMI smokers</i>)	n = 68	QC	Nicotine	-/-	exercise (OP)	leisure	control	6 mo
Veda et al. (<i>excluded MI and SUD</i>)	n = 60	QC	Alcohol	7/60	yoga (detox)	leisure	control	<1 mo
Williams et al. (<i>sedentary female</i>)	n = 60	QC	Nicotine	24/50	exercise-brisk walking (OP)	leisure	contact control	1 mo
Wood et al. (<i>Navy</i>)	n = 101	QC	Alcohol	4/180	psychodrama (residential)	leisure	TAU	<1 mo
Zhuang (<i>adult Chinese female</i>) & Zhao	n = 75	QC	Opiates	120/50	yoga (detox)	leisure	control group	6 mo
No significant between-group differences								
*Jones (<i>primarily male; n = 23</i>)	n = 26	QC	SUD	1/60	lyric analysis (detox)	leisure	song writing	1 day
Marcus et al. (<i>sedentary female</i>)	n = 20	QC	Nicotine	45/45	exercise (OP)	leisure	contact control	12 mo
Russell et al. (<i>female</i>)	n = 42	QC	Nicotine	27/60	exercise-jogging (OP)	leisure	contact control	18 mo
Shaffer et al. (<i>adults/methadone</i>)	n = 61	RCT	Opiates	22/75	yoga (OP)	leisure	group psychotherapy	10 mo
Silverman (2009) (<i>adults</i>)	n = 66	RCT	SUD	1/60	music (detox)	leisure	individual psychotherapy	1 day
Silverman (2011) (<i>adults</i>)	n = 140	QC	SUD	1/60	songwriting (detox)	leisure	individual psychotherapy	1 day
Silverman (2012) (<i>adults</i>)	n = 99	RCT	SUD	1/60	songwriting (detox)	leisure	control group	1 day

A blank cell (-) indicates the variable was not measured/reported. RCT = Randomized controlled trial; QC = Quasi-controlled study. Duration/dose = total sessions/length of sessions in minutes. Time of diff = follow up point at which significant between group differences were observed. TAU = treatment as usual. SRAT = systems releasing action therapy. MDFT = multi-dimensional family therapy. MI = motivational interviewing. CRA = community reinforcement. EBFT = ecologically-based family therapy. AMI = acute myocardial infarction. TC = therapeutic community. TLCC = time-limited care coordination. OP = outpatient. MI = Mental Illness. IP = inpatient Adol = adolescent.

* Comparison was another occupant-based intervention. Vedamuthachar was shortened to Veda.

3.1. Key findings

What 'areas of occupation' are most common in addiction intervention? Are some areas of occupation more effective than others in addressing substance use and/or other recovery-related outcomes?

Seven 'areas of occupation' have been defined in the field of occupational therapy: activities of daily living (ADL), instrumental ADL (IADL), leisure, play, rest/sleep, work, and education. Table 1 illustrates the interventions and the 'area of occupation' under which they fall, the population, sample size, type of addiction(s), duration and dose of intervention (in many cases only a single session), treatment setting, comparison groups, whether a significant difference was found, and the follow-up point at which that significant difference occurred. Of the seven areas of occupation, leisure interventions were most common. Leisure occupation-based interventions yielded a mix of significant 'between group' differences and no significant difference (see Table 1). The area of work was also used as an intervention for addictive disorders, and significant 'between group' differences were found in the areas of drug and alcohol consumption as well as psychiatric and medical status when compensated work therapy was compared to a control group (Kashner et al., 2002).

Following leisure, the second most common area of occupation used as an intervention for addictive disorders was social participation. For example, a therapeutic community in which participants adopted social roles and their interactions formed the content of the intervention was considered an occupation-based social participation intervention whereas a CBT group in which participants were being taught new cognitive and behavioral tools to integrate into their personal lives outside of therapy was considered didactic rather than occupation-based, although elements of social interaction were nonetheless present. A 'social participation' intervention was considered occupation-based if the

intervention was focused on social interaction itself, rather than social interaction being a by-product of the intervention. Some may argue that any intervention could be considered a social participation occupation; social interaction occurs in psychotherapy, for example. In this study, when social participation made up the content and was the sole focus and aim of the intervention, the intervention was considered an occupation-based social participation intervention. Notably, all social participation interventions produced significant 'between group' differences (see Table 1), although effect sizes were poor (see Table 2) (Cohen, 1992).

Findings of social participation interventions were as follows. Rigter et al. (2013) found that, in comparison to psychotherapy, multi-dimensional family therapy elicited significantly better treatment retention, lower prevalence of cannabis use disorder, and in heavy users, significantly fewer consumption days than those in the psychotherapy control group. Rowe et al. (2007) found that, in comparison to standard therapy and jail diversion, a community-oriented group intervention yielded decreased alcohol use in the intervention group and increased use over time in the control group. Sacks, McKendrick, and Hamilton (2012) found a prison therapeutic community to be more effective in reducing drug use, criminal activity, exposure to crime, and reincarceration in female inmates with SUDs than cognitive behavioral therapy. They also found significantly greater increases in mental health functioning in the prison therapeutic community group compared to the cognitive behavioral therapy group. Slesnick, Erdem, Bartle-Haring, and Brigham (2013) found a community reinforcement approach, motivational interviewing, and ecologically based family therapy to all elicit greater abstinence following the intervention, but those with motivational interviewing showed faster relapse compared to ecologically based family therapy. Finally, Smelson et al. (2012) found time limited care coordination (recreation therapy and peer support) to yield

Table 2
Outcomes of occupation-based interventions by type of study.

Outcome	Randomized control			Quasi-controlled
	Kashner et al. (CI)	Shaffer	Smelson	Rowe et al.
Sample Size	n = 142	n = 61	n = 102	n = 114
Addiction Severity Index		NS		
Family		NS		
Employment		NS		
Drug consumption	.08 (–.32, .48)	NS		0 (–.48, .48)
Alcohol consumption	.05 (–.35, .44)	NS		.05 (–.43, .53)
Psychiatric symptoms	.16 (–.24, .56)	NS		
Medical status	.21 (–.19, .61)	NS		
	Russell et al.	Albornoz et al.	Sacks et al.	Vedamurthachar et al.
Sample Size	n = 42	n = 24	n = 468	n = 60
Beck Depression Inventory		.10 (–.70, .90)	.01 (–.18, .20)	.24 (–.27, .75)

Results reflect comparisons from baseline to the longest follow-up period. Cohen's d effect sizes with confidence intervals are reported. A blank cell indicates the variable was not measured. NS indicates no significant difference.

a 48% decrease in alcohol use versus a 33% decrease in alcohol use in the health education control group from baseline to 6 months.

No other areas of occupation were represented among the occupation-based interventions used for addictive disorders.

In persons with addictive disorders, are occupation-based interventions more effective than treatment as usual in improving short and long-term recovery outcomes? The two most common outcome measures used in the studies included in this review were the Addiction Severity Index (ASI) and the Beck Depression Inventory (BDI). While the BDI is arguably only relevant for a subset of studies examining persons with comorbid diagnoses of addictive disorders and depression, it is notable that it is the only outcome measure aside from the ASI used with enough frequency to allow for quantitative analysis. We have included it in our analyses based on the frequency with which it was used while acknowledging that its applicability is limited. Table 2 exemplifies the effect sizes of occupation-based interventions used to treat addictive disorders measured by these two common outcome measures. Statistical analysis elicited poor effect sizes (Cohen, 1992) favoring occupation-based interventions delivered in Sacks et al. (2012) and Rowe et al. (2007) which both fall under the social participation area of occupation. Small but significant effect sizes (Cohen, 1992) were obtained for interventions delivered in Kashner et al. (2002), Vedamurthachar et al. (2006), and Albornoz (2011). The latter two fell under the leisure area of occupation and the first fell under work.

3.2. Other findings

Table 1 compiles data from a wide range of studies that vary not only in population and sample (e.g. women, adolescents, veterans, persons with general SUD diagnoses versus specific substance-related disorders such as marijuana use disorder) but also in the occupation used as an intervention, the duration (from single session to 6 month recovery programs), the setting (e.g. inpatient, outpatient, detox), outcomes measured, and comparison groups used. Due to the heterogeneity of the data (specifically the varied outcome measures) inferential statistical analyses were not feasible; because of the variability observed, separating findings by variable did not produce data needed for enough power to conduct meaningful inferential tests. Table 1 therefore offers descriptive details of our findings, which we qualitatively synthesized to address our secondary research questions discussed below.

What didactic and/or other treatments are occupation-based interventions compared to? In randomized and quasi-controlled trials, occupation-based interventions were compared to the following interventions: jail diversion (Rowe et al., 2007), individual psychotherapy (Ermalinski, Hanson, Lubin, Thornby, & Nahormek, 1997; Rigter et al.,

2013; Silverman, 2009, 2011), cognitive behavioral therapy (Sacks et al., 2012), group psychotherapy (Shaffer et al., 2004), cognitive distraction (Daniel, Cropley, & Fife-Schaw, 2006), and various controls and/or treatment as usual (Albornoz, 2011; Kashner et al., 2002; Li, Chen, & Mo, 2002; Li et al., 2013; Marcus et al., 1995; Moran, Watson, Brown, White, & Jacobs, 1978; Russell, Epstein, Johnston, Block, & Blair, 1988; Scerbo, Faulkner, Taylor, & Thomas, 2010; Silverman, 2012; Slesnick et al., 2013; Smelson et al., 2012; Taylor, Houston-Miller, Haskell, & Debusk, 1988; Vedamurthachar et al., 2006; Williams et al., 2011; Wood, Del Nuovo, Bucky, Schein, & Michalik, 1979; Zhuang, An, & Zhao, 2013). Two studies add little to the question of whether occupation-based interventions were more effective than treatment as usual in that they compared occupation-based interventions to other occupation-based interventions; one showed a significant difference favoring music therapy with lyric analysis over an occupational therapy crafts group (James, 1988), and another showed no significant difference between lyric analysis and song writing groups (Jones, 2005).

Generally speaking, jail diversion can be a strong motivator in the context of a number of different treatments for addictive disorders. The study listed in Table 1 that used jail diversion as a comparison intervention (Rowe et al., 2007) described specific clinical services provided in which clinicians worked with clients, courts and legal personnel to navigate the legal system and direct clients toward medical care and avoid incarceration. These clinical services served as the jail diversion intervention, which was used as a control group along with treatment as usual. The control of jail diversion and treatment as usual was compared to jail diversion along with participation in a therapeutic community with peer support.

Overlap existed between individual psychotherapy, group psychotherapy and cognitive behavioral therapy treatment comparisons, and sufficient enough descriptions were not provided in the studies to determine the extent of difference between these comparison groups other than the distinction that CBT and group psychotherapy involved more than one client per session with an individual clinician.

What occupation-based interventions have been used to treat addictive disorders? In the area of leisure, yoga, exercise (walking, exercise bike, rower), psychodrama, systems releasing action therapy, and music therapy (improvisation, song writing, music bingo, lyric analysis) were used as interventions for addictive disorders. A number of social participation interventions were also used for this population including therapeutic communities, time limited care coordination, community reinforcement approaches, ecologically based family therapy, multidimensional family therapy, peer support, and 12-step facilitation. Finally, in the area of work, compensated work therapy was used as an intervention (see Table 1).

What kinds of addictions are treated with occupation-based interventions, and are certain types of occupation used for certain kinds of addiction? Addiction to alcohol, opiates, tobacco, and cannabis were addressed with occupation-based interventions.

Many studies did not examine the effects of an occupation-based intervention on a single type of addictive disorder but rather studied the effects of the intervention on substance use disorders in general. Music therapy (Albornoz, 2011; James, 1988; Jones, 2005; Silverman, 2009, 2011, 2012), time limited care coordination (recreation therapy and peer support) (Smelson et al., 2012), compensated work therapy (Kashner et al., 2002), community reinforcement, ecologically based family therapy (Slesnick et al., 2013), and community-oriented group interventions (Rowe et al., 2007; Sacks et al., 2012) were used for general substance use disorder diagnoses.

Regarding more specific diagnoses, tobacco use disorder was treated solely with exercise as an intervention (Daniel et al., 2006; Marcus et al., 1995; Russell et al., 1988; Scerbo et al., 2010; Taylor et al., 1988; Williams et al., 2011), and addiction(s) to opiates were treated solely with yoga-based (Shaffer et al., 2004; Zhuang et al., 2013) or similar eastern body-mind interventions such as tai chi (Li et al., 2013) and qigong (Li et al., 2002). Cannabis use disorder was treated with multidimensional family therapy (Rigter et al., 2013), and alcohol use disorders were treated with yoga (Ermalinski et al., 1997; Vedamurthachar et al., 2006), psychodrama (Wood et al., 1979), and systems releasing action therapy (Moran et al., 1978).

It is noteworthy that all tobacco use disorders were treated with exercise, and that significant outcomes were largely short term/immediate. Daniel et al. (2006), Scerbo et al. (2010), and Williams et al. (2011) all found significant differences in smokers' craving/desire to smoke during or immediately following the intervention. While Taylor et al. (1988) found a lower smoking prevalence among smokers at 6 months following a 2–26 week exercise intervention, studies with longer follow up periods (Marcus et al. (1995) at 12 months and Russell et al. (1988) at 18 months) found no significant difference in the exercise intervention group.

What kinds of substance use and other outcomes are examined?

In the studies reviewed, substance use outcomes measured included self-report of use and craving, urine or saliva analysis of use, diagnostic interviews for substance use disorders, and standardized measures of addictive disorder symptoms, related problems, and readiness to change. Standardized symptom measures included the Addiction Severity Index (ASI), Revised Symptom checklist (SCL-90-R), Brief Symptom Inventory (BSI), and the Circumstances, Motivation, and Readiness Scales for Substance Abuse Treatment (CMR). Studies also measured a number of secondary outcomes related to depression, mood, personality, anxiety, post-traumatic stress disorder symptomology, criminal data, hospitalization data and use of medical services, affective state activation-deactivation, attendance to treatment programs, anhedonia scales, physical wellness, motivation and readiness to change, and locus of control.

4. Discussion

A key finding of this review is that all social participation interventions found significant between group differences favoring social participation over the control or comparison group. However, ASI and BDI effect sizes of social participation interventions were poor (Cohen, 1992). By contrast, interventions in the areas of work and leisure had mixed results; some elicited significant between group differences favoring the occupation-based intervention whereas others did not. However, those that did find a positive ASI or BDI effect elicited greater effect sizes (although still generally small) than the poor effect sizes of social participation interventions.

While ASI and BDI effect sizes of social participation, work, and leisure were poor to small, considering the non-invasiveness, low cost, and ease of access of occupation-based interventions, the fact that work, leisure, and social participation can elicit small but positive effects

in the lives of individuals is compelling. Such interventions may be easily integrated into the daily lives of those seeking treatment. It may be inferred from the findings reported in Table 2 that the non-invasive facilitation of meaningful engagement in occupational performance may exhibit therapeutic benefits via alleviating symptoms of substance use and depression.

An example of the potential benefits that can result by facilitating social participation in persons recovering from addictive disorders is seen in Kaskutas and colleagues' demonstration of the effectiveness of "MAAEZ" (Making Alcoholics Anonymous Easier) (Kaskutas, Subbaraman, Witbrodt, & Zemore, 2009). Kaskutas et al. describe MAAEZ as "an evidence-based intervention that is easily implemented in existing treatment programs" (p. 228), consisting of six weekly sessions with homework to address resistance to participation in 12-step programs. MAAEZ encourages participants to reach out to other 12-step members (primarily Alcoholics Anonymous [AA] members), attend meetings they have never been to, and speak to members on the phone. MAAEZ can be viewed as a component of broader 12-step facilitation (TSF) interventions, but where TSF emphasizes and examines overall involvement in 12-step programs, MAAEZ more specifically helps clients learn to socialize in AA. MAAEZ is primarily concerned with helping clients become involved in the *social fellowship* of 12-step programs (Subbaraman, Kaskutas, & Zemore, 2011), and produces greater abstinence rates in participants at 6 and 12-month follow-up points compared to treatment as usual (Kaskutas et al., 2009). By underscoring the effectiveness of social participation occupation-based intervention, other approaches like this one may be integrated into treatment to potentially improve outcomes.

The frequency with which the BDI appeared as an outcome measure may be a reflection of high rates of comorbidity between addictive disorders and depression. For instance, studies suggest nearly one third of persons with major depressive disorder also have a substance use disorder (Davis, Uezato, Newell, & Frazier, 2008). In fact, "the mental health field has long debated whether these conditions are independently occurring disorders or are overlapping illnesses, intertwined by common etiological and vulnerability factors" (p. 14). Perhaps the frequency with which the BDI appeared in this review is a further reflection of this perspective. Another possibility is that persons with addictive disorders and depression are a target for occupation-based intervention, perhaps due to an exaggeration of occupational deficit present in persons with this particular comorbidity. Literature suggests, for example, that persons with substance use disorders and major depression have greater social and personal impairment (Davis et al., 2008) that may warrant occupation-based intervention and account for the prevalence of the BDI as an outcome measure among our findings.

Also notable was that all tobacco use disorders were treated with exercise. While exercise as an intervention is not necessarily occupational in nature, findings related to exercise for tobacco use disorder illustrate important information about occupation-based intervention for addictive disorders. The majority of exercise interventions that had significant impacts on desire to smoke had immediate effects. Longer term follow up points did not illustrate a change in smoking behavior with the exception of one study looking at persons who exercised regularly for 2–26 weeks following acute myocardial infarction (Taylor et al., 1988). These findings perhaps emphasize that addictive disorders are long term problems. That exercise reduced desire to smoke during and immediately following exercise interventions suggests that, for exercise to be effective as an occupation-based intervention, it must be adopted and incorporated into the ongoing daily lives of individuals wishing to reduce their desire to smoke. In other words, exercise must become an occupation.

4.1. Limitations and future research

While researchers followed suggested guidelines for systematic reviews to ensure appropriate search criteria, appraisal, and inclusion/

exclusion criteria, the distinction between occupation-based interventions and other more didactic interventions (including didactic occupational therapy interventions) leaves room for contention. For instance, some interventions are primarily didactic but include a small occupational performance component. Others, because of the nature of the intervention, do not clearly fall on one or the other side of the distinction, such as mindfulness training. However, based on literature illustrating deficits in mastery and the need for actual performance of new occupations among the addictive disorder population, the researchers felt that distinguishing occupation-based performance as an intervention for the purpose of assessing its relative effectiveness was an important area of investigation for occupational therapy and addiction treatment specialists. A rigorous consensus-establishment process was used to ameliorate the above-mentioned concerns.

Many studies that used occupation-based interventions did not solely focus on an addiction population but rather served as treatments for another mental health diagnosis population. Nonetheless, some of these studies reported findings related to substance use disorders and may provide valuable information that was not included in this review. Future reviews may examine the effectiveness of occupation-based interventions for other mental health diagnoses, particularly depressive disorders, and then examine substance use outcomes emerging within these studies to build on the findings of this review.

To maximize rigor, this study only reported findings from controlled studies. However, a number of studies reporting pre/post findings of occupation-based interventions for addictive disorders may provide further useful information regarding effectiveness. Furthermore, while common outcome measures were used to report effect sizes, in general there existed very little homogeneity among studies due to the nature of this review, limiting the potential for meta-analyses.

Interestingly, only three areas of occupation were represented by the occupation-based interventions for addictive disorders found in this review – leisure, work, and social participation. Considering the literature illustrating occupational deficits in these areas among the population of persons with addictive disorders, it is understandable that these areas of occupation would be adopted as interventions. For instance, diagnostic criteria for addictive disorders specifically note problems in social, recreational, and vocational performance (Thompson, 2007). Yet research also shows that drug and alcohol use can compromise self-care, community mobility, rest and sleep cycles, and many other aspects of living (Buckley, 2005), thus warranting the exploration of using occupation-based interventions from other areas of occupation such as activities of daily living (ADL). Further investigation of the use and effectiveness of occupation-based interventions in the areas of ADL, IADL, and other areas of occupation may therefore be of paramount importance for occupational therapists working with clients with addictive disorders.

It is notable that of 1095 papers screened, only eight were eligible for quantitative analysis, suggesting a need for more rigorous, controlled effectiveness studies of occupation-based interventions for addictive disorders. Furthermore, our inclusion criteria allowed for a very low sample size. While this was due to the researcher's aim to cast a wide net and include a broad range of studies examining the topic in question, it also allowed for studies that may have been more a series of case studies than prospective studies with reasonable power. The eight studies included in quantitative analysis had sample sizes well over five participants, as did most of the other studies; however, it may be beneficial to perform future studies with more stringent sample size inclusion criteria (but perhaps broader diagnosis-related criteria) to maximize significance and power of findings.

This review suggested a conceptual distinction – interventions incorporating performance of an occupation versus those where occupational performance is absent – that is not prevalent in studies of treatment for addictive disorders. To better answer the research questions posed in this study, high quality effectiveness studies that specifically adopt the proposed distinction would be helpful. Additionally, further study and

deliberation of the conceptual distinctions proposed and their applicability to various types of interventions would help to operationalize the distinction for future comparative studies and reviews.

Additionally, while some studies compared occupation-based interventions alone to treatment as usual, others combined occupation-based intervention with treatment as usual and compared this group to those receiving just treatment as usual. The effectiveness of occupation-based interventions alone versus as complimentary to treatment as usual therefore remains in question and warrants further study. Due to the existing complexity of the present review, we did not separate data on this basis. Future examination of the effectiveness of occupation-based intervention alone versus as complimentary to treatment as usual will be important in translating findings into practice and providing guidelines for how to implement occupation-based intervention in the context of current treatment programs.

Finally, the variability of populations, samples, duration of treatment (including single sessions), treatment setting, type of addiction, type of intervention, outcome measures, and time of measures/follow-up makes it difficult to synthesize and interpret findings from this review. While the heterogeneity of data limited the potential power of inferential statistical analyses of the data, future studies limiting searches by these variables and then adjusting inclusion/exclusion criteria to maximize findings within each area may produce insightful findings. While this exploratory review cast a wide net and thus brought together highly diverse studies, this review likewise provides potential guidelines for more narrowly focused future reviews and or prospective outcome studies. For instance, limiting searches to studies of dually-diagnosed participants with similar duration of interventions and shared outcomes measures of the ASI and BDI would help provide more rigorous claims about comparative effectiveness. Finally, if after extending inclusion/exclusion criteria these searches produce few results, such information can illuminate important areas for future effectiveness trials.

5. Conclusions

Occupation-based interventions – that is, interventions that incorporate the performance of an occupation – in the areas of work, leisure, and social participation have been used to treat substance related and addictive disorders. While social participation interventions all elicited better outcomes than their respective control/comparison groups, effect sizes on those that used the ASI and BDI were poor. Occupational performance of various types of leisure activities and work elicited larger (but small) effect sizes on the four studies whose outcome measures were the ASI and/or BDI, but not all leisure-based interventions elicited better outcomes than their comparison groups. None of the other areas of occupation were represented by occupation-based interventions used for addictive disorders, although they may be helpful for some members of this population. Integrating occupation-based interventions in individuals' lives may elicit small but significant improvements in recovery from substance related and addictive disorders.

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