Recovery From Comorbidity: Depression or Anxiety With Alcohol Misuse—A Systematic and Integrative Supradisciplinary Review and Critical Appraisal

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Abstract
Comorbidity among mood, anxiety, and alcohol disorders is common and burdensome, affecting individuals, families, and public health. A systematic and integrative review of the literature across disciplines and research methodologies was performed. Supradisciplinary approaches were applied to the review and the ensuing critical appraisal. Definitions, measurement, and estimation are controversial and inconstant. Recovery from comorbidity cannot be easily extricated from a sociocultural milieu. Methodological challenges in quantitative and qualitative research and across disciplines are many and are discussed. The evidence supporting current treatments is sparse and short-term, and modalities operating in isolation typically fail. People easily fall into the cracks between mental health and addiction services. Clinicians feel untrained and consumers bear the brunt of this: Judgmental and moralistic interactions persist and comorbidity is unrecognized in high-risk populations. Competing historical paradigms of mental illness and addiction present a barrier to progress and reductionism is an impediment to care and an obstacle to the integration and interpretation of research. What matters to consumers is challenging to quantify but worth considering: Finding employment, safe housing, and meaning are crucial to recovery. Complex social networks and peer support in recovery are important but poorly understood. The focus on modalities of limited evidence or generalizability persists in literature and practice. We need to consider different combinations of comorbidity, transitions as opposed to dichotomies of use or illness, and explore the long-term view and emic perspectives.

Keywords
mental health, addiction, integrative review, comorbidity, dual diagnosis, critical appraisal

Introduction
Comorbidity (aka dual diagnosis or co-occurring disorders) in mental health refers here to disorders of mental illness and addiction occurring together in the same individual over a lifetime. Understanding comorbidity as a challenge to public health and clinical care evolved late in the 20th century (Drake, 2000).

This supradisciplinary (Balsiger, 2004; Kötter & Balsiger, 1999) integrative review and critical appraisal examines the breadth and diversity of perspectives on a complex health issue not easily contained within disciplinary paradigms (Crawford, Crome, & Clancy, 2003; Whittemore & Knafl, 2005).

Background
Definitions, Terminology, and Associated Issues
The term consumer is used in this review for clarity, but it is acknowledged that some prefer other terms such as client or patient. How comorbidity is defined, measured, and estimated remains controversial and inconstant, despite the adoption of consistent terminology having been identified as a useful practical step in overcoming barriers to complex and fragmented services in Australia and elsewhere (Canaway & Merkes, 2010).

Comorbidity is used as the umbrella term in this article, as it is the term most commonly encountered in the literature. What defines recovery from comorbidity cannot be easily extricated from lived experience and the meanings and priorities an individual attributes to their recovery, within their sociocultural milieu. It is more than the presence or absence

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of symptoms and signs. The conceptualization and composition of recovery are elusive and inconstant and definitions and descriptions of recovery in mental illness, addiction, and comorbidity are many and varied (Bradizza, Stasiewicz, & Paas, 2006; Onken, 2007). A return to an existence with purpose or meaning is a common theme (Lloyd, 2010; Onken, 2007; Ramon, 2009).

Explicit criteria and definitions of recovery are often used etically, but those with lived experience of comorbidity have rarely been asked how they define recovery (American Psychiatric Association, 2000; Staiger et al., 2011; World Health Organisation [WHO], 2006). Definitions used by clinicians can differ from researchers (Phillips, 2007).

Why This Review Is Needed
This review focuses on Australian data to some degree in providing examples and an epidemiological underpinning but extends to the international perspective wherever possible, particularly with data from the United Kingdom and the United States of America.

Comorbidity, surprisingly to some, is “expected, rather than considered an exception” (Minkoff, 2001, p. 597), especially when addiction is the initial diagnosis but also in most where it is not (Alegria et al., 2010; Canaway & Merkes, 2010; Cosci & Fava, 2011; Drake, 2007; Driessen et al., 1998; Frigola, Fonseca, Mateu, Castillo, & Torrens, 2008; Horsfall, Cleary, Hunt, & Walter, 2009; Jerrell, Hu, & Ridgely, 1994; Kay-Lambkin, Baker, & Lewin, 2004; Minkoff, 2001; Mortlock, Deane, & Crowe, 2011; Ngo, Tait, & Hulse, 2011; Xiong Lai & Qi Rong, 2009). Twelve-month estimates are the focus of much epidemiological investigation. Comorbidity estimates range from 30% to 80% across diverse study types and measures (Canaway & Merkes, 2010; Kessler, 1997; Weaver et al., 2003). These include population-based, inpatient and outpatient treatment studies, epidemiological literature reviews, investigations of comorbidity rates in treatments settings in Australia and the United Kingdom, epidemiological analysis of treatment episodes or national surveys (Australia, United States), review by the authors of Australian national data sets, and quantitative estimates based on screening or clinical assessment in treatment settings (Australian Institute of Health and Welfare [AIHW], 2011; Bradizza et al., 2006; Cosci & Fava, 2011; Howard, Stubbs, & Arcuri, 2007; Kay-Lambkin et al., 2004; Kessler, 2004a; Mortlock et al., 2011; Staiger et al., 2011; Teesson, Slade, & Mills, 2009; Xiong Lai & Qi Rong, 2009). We focus on mood and anxiety disorders in this review (due to their greater disease burden) and on alcohol, being most commonly encountered in comorbidity (and in addiction in general) and with the greatest direct and indirect impacts on health and society in most developed countries (Australian Bureau of Statistics, 2007; Australian Institute for Health and Welfare, 2009; Degenhardt, 2008; WHO, 2011; Xiong Lai & Qi Rong, 2009).

Mood and Anxiety Disorders: Scope of the Problem
The National Surveys of Mental Health and Wellbeing (NSMHWB) are telephone surveys conducted every decade in Australia, across several thousand participants, using the WHO Composite International Diagnostic Interview (CIDI) framework, and give a broad representative example of the typical distribution of mental illness and substance use in a developed country (Australian Bureau of Statistics, 2007; Kessler, 2004b). According to the 2007 Survey, 45% of adults have had (or will have) one or more mental health disorders (including substance use disorders) in their lifetime (Australian Bureau of Statistics, 2007)

In 2007, 20% of the adult population experienced a mental disorder (Australian Bureau of Statistics, 2007). Anxiety disorders were more than twice as common as affective disorders (Australian Bureau of Statistics, 2007). The population fraction with a lifetime diagnosis of mental illness has risen progressively over recent decades, especially for anxiety and mood disorders; combined, they were the second leading cause of disease burden in 2010 in Australia (Australian Institute of Health and Welfare, 2009, 2010). However, diagnostic criteria have also changed and continue to evolve, and broadening umbrellas of how we define mental illness are a contributing and contentious factor to this increase (Wakefield, Schmitz, & Baer, 2011) (Figures 1 and 2).

Recent research in New Zealand suggests that prospective measures of lifetime risk may be closer to double the risk estimated by such retrospective measures due to recall failure and underreporting (Moffitt et al., 2010).

Alcohol and Substance Use: Scope of the Problem
In Australia, alcohol use disorders occur at triple the rate of all other drug use disorders combined with 12-month and lifetime prevalence rates (Australian Bureau of Statistics, 2007; Mortlock et al., 2011). In addiction treatment settings and hospital encounters, alcohol is the number one drug of
concern in more than half of encounters; this proportion is also increasing (Australian Bureau of Statistics, 2007; Mortlock et al., 2011; Xiong Lai & Qi Rong, 2009).

Comorbidity: Scope of the Problem

Comorbidity is more chronic, persistent, and disabling than mental illness or addiction alone with comparatively poor outcomes including greatly reduced life expectancy (Chang et al., 2011; Colton & Manderscheid, 2006; Cosci & Fava, 2011; Kessler, 2004a; Withers & Hirsch, 2003). Those with comorbid conditions are at higher risk of suicide (Gimelfarb, 2007; Schmidt, 2011; Withers, 2003), physical illness (communicable and noncommunicable; Batki et al., 2009; Drake & Mueser, 2000; Mueser, Drake, & Wallach, 1998; Phillips & Labrow, 2000), homelessness, becoming a perpetrator or a victim of crime (Drake & Mueser, 1996, 2000; Marshall, 1998; Mueser et al., 1998; Wright, Gournay, Glorney, & Thornicroft, 2002), and reduced workforce participation (Schmidt, 2011).

In addition, rates of relapse and rehospitalization are higher (Mueser et al., 1998; L. M. Schmidt, Hesse, & Lykke, 2011), and people with comorbidity are heavy users of emergency services and inpatient beds (Cosci & Fava, 2011; Dickey & Azeni, 1996; Drake & Mueser, 2000; Teesson et al., 2009).

The risk of addiction is 20 times greater in inpatients who have been diagnosed with a mental illness (Xiong Lai & Qi Rong, 2009). Rates are especially high in forensic psychiatric patients and inmates in general (Ogloff, Lemphers, & Dwyer, 2004). This quantitative data is, however, clouded by variable definitions of comorbidity and by variations in classification and sampling across a multitude of diagnoses (Kessler, 2004a).

The literature also indicates systematic underreporting of vulnerable populations: in the examples from the NSMHWB used earlier, there is exclusion of people not living in private dwellings, and thereby of those in hospitals, residential facilities, psychiatric hospitals or clinics, addiction treatment services, prison, the homeless, and residents of hostels. These are all sections of the population that are at increased risk of comorbidity (Australian Institute of Health and Welfare, 2010; Drake & Mueser, 1996).

Most people with posttraumatic stress disorder (PTSD), arguably more common than depression, will have an addiction during their lifetime (Australian Bureau of Statistics, 2007; Koford, 1993). In addition, those with PTSD-addiction comorbidity relapse quicker, tend to have more severe PTSD symptoms, and have poor outcomes (Bradizza et al., 2006; Ouimette, Wolfe, & Chrestman, 1996; Saladin, Brady, Dansky, & Kilpatrick, 1995). A history of trauma is usually evident among women with comorbidity and youths with alcohol use disorders (Fallot, 2005; Hawke, Ford, Kaminer, & Burke, 2009).

Method

A multidisciplinary non-date-restricted University of Western Australia Supersearch (MetaLib) initially undertaken in September 2011 included the databases APA-FT, Blackwell Synergy, JSTOR, Ebsco Megafile Premier, Proquest 5000, Science Direct and Wiley Interscience, for “comorbidity” OR “co-morbidity” in title and produced 11,044 results of which the first 498, ranked by the MetaRank algorithm, were examined by abstract for relevance and reviewed in detail as appropriate.

A multidisciplinary UWA MetaLib Supersearch for “dual diagnosis” in title, for 1970-September 2011 produced 1198 articles, 214 found relevant by abstract were reviewed.

Medline search using the keywords and Boolean operators (“client” OR “consumer” OR “lived experience”) AND (“alcohol” OR “addiction” OR “co-morbidity” OR “comorbidity” OR “dual diagnosis” OR “alcoholism” OR “dependence”) AND (“mental illness” or “psychiatric illness” OR “mood disorder” OR “depressive” OR “depression” OR “anxiety” OR “anxiety disorder” OR “PTSD” OR “post-traumatic stress disorder” OR “bipolar”) returned 174 results. Relevant articles (by abstract) were examined in detail.

Relevant references identified from citations and encountered during drafting, review, and editing of the article were also included.

Etiology: Hypotheses and Models

Traditional theories of etiology in comorbidity include the direct causal (one causes the other); the indirect causal (one disorder affects a separate variable that is a causative factor in the second disorder); bidirectionality, and the theory of shared common factors (Canaway & Merkes, 2010; Kessler, 2004a; Mueser et al., 1998). Hypotheses of underlying genetic etiology have yet to demonstrate conclusive scientific evidence and are unable to be proven on grounds of statistical inference by definition (Kessler, 2004a).
Models for mental illness treat it as the primary disorder, and treatments for addiction assume that it is the primary disorder (S. Brady et al., 1996; Shulman, 1995). Historically, the medical community has tended to see addiction as a secondary problem when both are present (Shulman, 1995). Research has recently begun exploring consumer perspectives that suggest that the motivations underlying alcohol use are similar to the general population (Robert & Kim, 2000).

This desire to identify alcoholism or mental illness as a primary and secondary duality is prominent and persistent (Anthony, Myers, Corte, & James, 1994; Crawford et al., 2003). Alcohol use is biologically plausible as a potential causal factor of depression; attempts to ascertain a temporal relationship with anxiety tend to point in the opposite direction (Jane-Llopis & Matytsina, 2006). Although the hypothesis of addiction as a process of self-medication has predominated internationally for some time (Kenny, Kidd, Tuna, Jarvis, & Robertson, 2006; Koford, 1993), sophisticated statistical methods are yet to elucidate this “temporal priority” that is often assumed in the literature (Kessler, 2004a, p. 731).

There is growing criticism of this directional focus in research, and the area is replete with epidemiologically contradictory findings (Back, Brady, Sonne, & Verduin, 2006; Coombes & Watton, 2007; Koford, 1993; Kuo, Gardener, Kendler, & Prescott, 2006; Maremmani et al., 2006; Marquenie et al., 2006; Thomas, Randall, Book, & Randall, 2008). The focus is on the quantitative analysis of specific ethically hypothesized criteria and associations, with little underlying or associated qualitative or exploratory research (Boschloo et al., 2011; Horsfall et al., 2009). That neither psychology nor biology operates exclusively from the other is a well-established quantifiable phenomenon (Eisenberg, 1986).

Themes of “self-medication” do manifest, in different fashions, but reasons given by consumers in discussing their alcohol and drug use are often consistent with those given by people with addiction issues but without mental illness (Healey, Peters, Kinderman, McCracken, & Morriss, 2009).

McKeown raises the notion that, from the perspective of a consumer (within the self-medication hypothesis), it may be experienced that alcohol use is better at symptom control than prescribed psychotropic medications, in terms of direct effects on symptoms and adverse effects (McKeown, Stowell Smith, Derricott, & Mercer, 1998).

Key Issues in the Field

What Actually Matters to Consumers?

This is a question rarely asked but one with the potential to move research and recovery forward. Results can differ greatly from the priorities of clinicians: for example, residents in a social model comorbidity treatment program valued “individualised standards of therapeutic success,” and such ambiguity presents challenges in how we integrate this with quantitative research and a desire for objective benchmarks (Weinberg & Koegel, 1996, p. 284). Finding employment or returning to education are identified as crucial to recovery by clinicians and consumers both, but are weighted heavier as a priority by consumers (Karen Leigh & Ian, 2009; Laudet, Magura, Vogel, & Knight, 2000; Palmieri & Accordin, 2004; Sainfort, Becker, & Diamond, 1996).

As another example, the democratic nature of treatment in social milieu models in addiction services is valued by consumers, with scope for goals and outcomes to be personally evolved and formulated within a broader framework (Weinberg & Koegel, 1996). This is an area warranting further research, and an area difficult to quantify.

Reductionism

Reductionism is a key issue and potentially a barrier to care and to the integration and interpretation of research (Thystrup & Johansen, 2009). Broader beginnings of conceptualizing comorbidity in the early 1990s have narrowed to a medical approach—despite the limited demonstrable benefit of this paradigm operating in isolation after two decades of research focusing on reductionism and positivism, in contrast to advances seen with areas of medicine more easily reduced to physiological systems (Gorski, 1994; McKeown et al., 1998). The shift in professional and lay conceptualizations of alcohol use disorders from a moral problem to a disease model in the mid-20th century (Jellinek, 1960; Watts, 1982) is an ongoing area of controversy and uncertainty.

Diagnostic inflation is a concern, through the “progressive colonisation . . . of perceived deviance,” without demonstrable gains in outcomes for people with comorbidity (McKeown et al., 1998, p. 65). The focus on pharmacological modalities and entrenched paradigms of limited evidence persists (K. T. Brady, 2005; Miller & Roache, 2009). The extent of publication and dissemination bias is only beginning to be examined (McLaren, 2009; Song et al., 2010).

Theories of a neurobiological basis are inferential (and perhaps abductive) but not experimental at their core, and the absence of biological markers remains (Drake, Osher, & Wallach, 1991; Frances & Suzette, 2001; McRae Clark et al., 2009; Redish, 2008). Limitations of such an approach include an unsupported focus on biological reductionism in the absence of evidence supporting benefit from this approach (Crawford et al., 2003); little consideration of the social and contextual construction of addiction; little evidence of individual or population prevention applicability of the approach; reliance on laboratory studies in rodents as a model for complex human behaviors and social forces; not accounting for nondependent drug-users; and the appearance of similar behavior patterns and processes occurring in everyday life in the absence of exogenous chemicals: an example of how we attempt to, with the best of intentions, solve a complex...
problem by inappropriately and falsely “taming” it with alluring but illusory reductionism (Belin & Everitt, 2008; Buckley, 2007; Chambers, 2008a; Conklin, 2005, p. 12; Griffiths, 2008; Hardcastle, 2008; Hart & Krauss, 2008; Neal & Wood, 2008).

Social Relationships

The social relationships of people with comorbidity (unlike mental illness in general) have been little researched, tending also toward short-term study, but it is likely that they can be helpful or harmful in recovery (Elspeth et al., 2004; Tracy & Johnson, 2007). Half of the typical social network is using/drinking or unsupportive of recovery, but it is impossible to reduce most relationships to being only positive or negative in their impact (Tracy & Johnson, 2007). People with comorbidity have less supportive social networks than those with an addiction alone, and there is a need to better understand how social networks change over the course of recovery (Tracy & Johnson, 2007).

Comparing Methods of Treatment and Care

The evidence supporting current treatment approaches in comorbidity is limited in quantity, short-term, methodologically limited, and needing replication (Farren & McElroy, 2010; Horsfall et al., 2009; Tiet & Mausbach, 2007). Modalities operating in isolation tend to fail: multidisciplinary and integrated approaches are associated with effectiveness at 12- to 24-month follow-up in some research (Farren, 2011; Howard et al., 2007; Moggi, Brodbeck, Költzsch, Hirsbrunner, & Bachmann, 2002; Moggi, Ouimette, Finney, & Moos, 1999). Questions needing further research in integrated and other multidisciplinary approaches include comparisons of parallel versus sequential integration. An array of diverse approaches are used in practice in Australia and internationally ranging from medication to individual or group psychotherapies to therapeutic communities and peer-support programs—there is no clear evidence singling out any particular treatment approach as advantageous although all serve a role (Drake, 2007; Horsfall et al., 2009; Iovieno, Tedeschini, Bentley, Evins, & Papakostas, 2011; Kay-Lambkin et al., 2004; Tiet & Mausbach, 2007).

There is little research looking at treatment approaches in particular combinations of comorbidity or beyond actively concurrent comorbidity (Tiet & Mausbach, 2007).

Little is still known about the course of comorbidity after the first years of treatment (Iovieno et al., 2011; Schmidt, 2011), no assessment of treatment satisfaction has reported data beyond 36 months, and single data-point satisfaction ratings predominate (Bradizza et al., 2006; Granholm, Anthenelli, Monteiro, Sevcik, & Stoler, 2003; Schulte, Meier, & Stirling, 2011). This approach is challenging to generalize to the nebulous and fluid variables, interactions, timeframes, sociocultural subtleties, and individualization inherent in comorbidity (Kelly, Daley, & Douaihy, 2012; Kessler, 2004a; Thylstrup & Johansen, 2009; Tracy & Johnson, 2007).

Calls for better integration of services have been occurring in the United States and internationally for 25 years (Bachmann, 1997; Cosci & Fava, 2011) with consensus among treatment providers but with a need for a stronger evidence base in support (Brooks & Penn, 2003; Mowbray et al., 1999; Tiet & Mausbach, 2007; Watkins, Hunter, Burnam, Pinecus, & Nicholson, 2005). Further research is needed in this area.

Gender differences is an area of clear deficit in research and in treatment despite strong suggestions of different associations by gender and a benefit of gender-specific programs (Fallot, 2005; Farren, 2011; Kessler, 2004a).

Pharmacotherapy

The evidence supporting the use of psychotropic medications in isolation in comorbidity is limited; the inclusion within multidisciplinary approaches of pharmacotherapy, however, can be of benefit. Such research, however, is usually assessing short-term outcomes (Iovieno et al., 2011; Nunes & Levin, 2004; Salloum, 2005; Torrens, Fonseca, Mateu, & Farré, 2005), and symptomatology according to the disease model, occurs in narrow trial populations (Wisniewski, 2009) and is at risk of biases of interpretation, publication, or dissemination that could be better addressed (Arias & Kranzler, 2008; Book, Thomas, Randall, & Randall, 2008; Lykke, Oestrich, Austin, & Hesse, 2010; McRae Clark et al., 2009; Nunes & Levin, 2004; Song et al., 2010). Clinical trial registers, a protection against publication bias, have recently been required by journal editors, in principle, but this is not enforced (International Committee of Medical Journal Editors, 2010; McCray & Ide, 2000; Prayle, Hurley, & Smyth, 2012; Song et al., 2010; WHO, 2012).

There is uncertain evidence of the role of antidepressant therapies in alcohol and depression comorbidity, even with short-term outcomes, with many studies involving patients receiving multiple treatment modalities concomitantly (Iovieno et al., 2011; Kelly et al., 2012; Le Fauve et al., 2004; Nunes & Levin, 2004; Pettinati et al., 2010; Tiet & Mausbach, 2007; Torrens et al., 2005). Benefits to depression outcomes may be greater than alcohol-related outcomes, but these are of low impact and needing replication (Nunes & Levin, 2004; Tiet & Mausbach, 2007; Watkins et al., 2005).

People with comorbidity are often excluded from medication trials for mental illness, even when included they drop out earlier, presenting dangers of overestimating therapeutic benefit (Adams, Liu-Seifert, & Kinon, 2007; Bradizza et al., 2006; Tiet & Mausbach, 2007).

Cessation of medication is cited as a cause of relapse in medical models but other possibilities are not always considered, including withdrawal syndromes and confounders such as consumers stopping medication because of relapse or...
commensurate withdrawal from other treatments (Howard et al., 2007). This is an area that may benefit from qualitative research to better appreciate consumer perspectives.

Peer-Support Approaches

The role of peer education and support is just beginning to be explored (Kenny et al., 2006). Persons with comorbidity are less likely to participate in 12-step-based peer-support programs (Powel & Kurtz, 1996). Complex social networks in recovery are poorly understood and peer support is highly valued by consumers, providing “insights that may not be available to professionals” (Lawrence-Jones, 2010, p. 124). There has been some exploration of (and support for) the helper-role and reciprocal-learning process as being key elements of successful recovery (Bogenschutz, Geppert, & George, 2006).

Relevant research in comorbidity is limited in quantity, external validity, and methodological clarity and conflicting in outcomes for and inclusiveness of people with comorbidity (Bogenschutz et al., 2006; Chappel & DuPont, 1999; Powel & Kurtz, 1996; Ward, 2011).

An avenue for exploration is comparing 12-step and other peer-based approaches (Bogenschutz et al., 2006). One notable study found little difference in directly comparing the 12-step approach with the secular Self-Management-And-Recovery-Training (SMART) in comorbidity recovery (Brooks & Penn, 2003).

It is difficult to separate the religious and spiritual component from 12-step programs from religious models of support (religious philosophies and terminology are intrinsic to the 12-step model), when attempting to undertake comparison with alternative peer-support models (Alcoholics Anonymous World Services, Inc., 2001; Ward, 2011). The key conclusion from the current state of 12-step research appears to be the absence of any clear evidence of harm or benefit, many who succeed in 12-step programs might do as well (or better) in other peer-support scenarios, and most participants in 12-step programs also receive professional care, which is not standard in the 12-step ethos (Bill & Alcoholics Anonymous, 1939/2001; Bogenschutz & Akin, 2000; Chappel & DuPont, 1999; Galanter, 2006).

Peer support makes further sense in enabling access to treatment for those deprived of normal professional channels—the homeless, the incarcerated, culturally and linguistically diverse subsets of larger communities, and where cost, time, or distance barriers to accessing care exist (Drake et al., 1991). It is also a way of utilizing social networks and modalities of communication inaccessible to “outsiders.” (Kenny et al., 2006).

Employment and Housing

An employment role (paid or voluntary), or other meaningful engagement such as returning to education, is highly valued as a component of recovery by consumers and aids in relapse prevention (Angela, Sheila, Kristin, & Timothy, 2005; Howard et al., 2007; Karen Leigh & Ian, 2009; Laudet et al., 2000; Palmieri & Accordin, 2004; Sainfort et al., 1996; Strickler, Whitley, Becker, & Drake, 2009).

Vocational rehabilitation for people with comorbidity is an area warranting further research (Wagborn, Chant, & Jonsdottir, 2011). One recent long-term qualitative study involving first-person accounts suggests that consumers identify symptoms of illness (or the fear of these) and medication side effects as major barriers to competitive employment (Strickler et al., 2009).

Housing (and homelessness) are important and under-rated elements of recovery in comorbidity and poorly understood by clinicians (Drake & Mueser, 2000; Padgett, Gulcur, & Tsemberis, 2006; Phillips, 2007; Tsemberis, Gulcur, & Nakae, 2004). Further research in this area is needed.

Family Intervention

Families can be a barrier to or an aid in recovery and avenues for beneficial intervention (Mueser et al., 2009). The presence of comorbidity (compared with mental illness alone) produces stronger judgmental and negative perceptions within families (Niv, Lopez, Glynn, & Mueser, 2007). The consumer experience of the roundabout of comorbidity can also be demoralizing for family members (S. Brady et al., 1996). There have been pilot attempts of family intervention models in the United States and more research is warranted (Mueser et al., 2009).

Harm Reduction or Abstinence?

Evidence suggests that an abstinence based approach is not predictive of better outcomes (Xie, Robert, Gregory, Lynn, & Anita, 2010). The conflicts between harm-reduction and abstinence approaches are about ideology, tradition, and religion, as well as academic research, and this hampers progress (Levy, 1993; Phillips, 1998; Phillips & Labrow, 2000).

Other Barriers to Care

Those with comorbidity easily fall between the cracks in mental health and addiction services: addiction service providers commonly identify the mentally unwell as unsuitable for treatment and vice versa (S. Brady et al., 1996; Canaway & Merkes, 2010; Howard et al., 2007; Kay-Lambkin et al., 2004).

Competing Models and Paradigms

The relative value placed on lived experience in the addictions field and mental health paradigms produces a fundamental philosophical and epistemological conflict among models of care. Differences in conceptualization, epistemology, and
treatment philosophies remain a barrier to comorbidity consumers (Canaway & Merkes, 2010; Coombes & Wratten, 2007; Karen Leigh & Ian, 2009; L. Schmidt, 1991).

Lack of communication, division of service provision, systems that can be antagonistic or contradictory, and disparate funding structures all limit cooperation and collaboration and generate “roundabouts” in Australia and internationally (Canaway & Merkes, 2010; Cosci & Fava, 2011; Kay-Lambkin et al., 2004; Kenny et al., 2006; Keyser, Watkins, Vilamovska, & Pincus, 2008). Comorbidity goes unrecognized in high-risk populations (Antony, 2011; Canaway & Merkes, 2010) and contributes to poor outcomes (Mortlock et al., 2011; Sabrina Janine, Petra Sylvia, John, & Mike, 2010).

**Knowledge, Training, and Understanding**

Health care providers can have a negative attitude toward people with comorbidity and feel untrained and unable to provide help (Barry, Tudway, & Blissett, 2002; Canaway & Merkes, 2010; Coombes & Wratten, 2007). Consumers with comorbidity encounter challenges including a lack of staff knowledge, judgmental and moralistic interactions, inflexibility, poor intersectoral referral, and exclusion from services (Lawrence-Jones, 2010; Staiger et al., 2011).

Comorbidity training programs for mental health workers improve knowledge but do not shift negative judgmental attitudes (Hughes et al., 2008). Medical models are, on current evidence, of limited effectiveness in comorbidity, which exacerbates the lack of confidence in and from medical providers (Phillips, 1998).

In consumers, experiences (or fear of) persisting stigmatization promote secrecy and withdrawal behaviors, impairing socialization, vocational rehabilitation, and fellowship/peer-support aspects of recovery (Bruce, Elmer, Michael, Jo, & Larry, 1997; Howard et al., 2007).

**Integrating and Interpreting Research**

Diagnostic criteria change regularly, and ambiguity and uncertainty surround terminology within and between disciplines and for the general public (Chambers, 2008b; Drake & Mueser, 2000; Lyman, 2010). Inconsistent definitions impair growth of the evidence base and cooperation across disciplines (Canaway & Merkes, 2010; Mortlock et al., 2011; Teesson et al., 2009). Neither the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000) nor the International Classification of diseases, 10th Edition define comorbidity as a discrete entity (WHO, 2006).

**Challenges in Research Approaches and Methodologies**

There is a need to research alcohol disorders as separate from other drugs of addiction (Bradiza et al., 2006), but the frequency of polysubstance use complicates research attempting to focus on any single substance (Crawford et al., 2003; Marshall, 1998). A recent review of psychotherapy and psychopharmacology reinforces calls for a less reductionist approach, greater multidisciplinary synthesis, and demonstrates that treatment modalities in isolation tend to fail (Kelly et al., 2012). Collaborative and multidisciplinary solutions are beginning to be sought, and an evidence base for the best practice is urgently needed (Schulte et al., 2011; Xiong Lai & Qi Rong, 2009).

**The Quantitative Approach**

Methodological challenges to quantitative research into comorbidity abound: maintaining consistent study settings; sample populations and diagnostic criteria; differences in diagnostic validity between clinicians and researchers; sparse descriptions of interventions make replicability difficult; consistency and reliability of screening and questionnaire methods; the need to exclude the more severely affected or currently ill; attrition; the impact of social/cultural/legal/drug nature/definitional changes over time; gauging to what extent cultural differences have impact on international generalizability; and the conflation of abstinent ex-drinkers with abstinent never-drinkers (Crawford et al., 2003; Drake, 2007; Horsfall et al., 2009; Mueser et al., 1998; L. Schmidt, 1991; Tarrier & Sommerfield, 2003).

A research focus on externally defined and quantified variables is unable to include assessment of differences in consumer valuation of various parameters, such as the relative importance of stable income and housing to health or symptomatology (Palmieri & Accordino, 2004).

Dichotomizing mental illness into “the well or the unwell” is of questionable benefit in recovery from comorbidity; evidence suggests that in practice, screening tools tend to be used inappropriately and infrequently (Canaway & Merkes, 2010; Mortlock et al., 2011), with risk of classification and spectrum biases (Thombs et al., 2011); on these tools, studies of comorbidity typically rely (Salo et al., 2011).

Exclusions on the assumption that mental illness must be antecedent to an addiction (Pietrzak, 2011; Tarrier & Sommerfield, 2003) limit external validity and, given the worse outcomes in comorbidity, may generate a selection bias in such trials producing and overestimation of any positive outcomes (Adams et al., 2007). Retrospective studies are limited and bias is a challenge, including forward telescoping, which could produce an age of onset bias with implications on the notions of mental illness and addiction “causality pathways” (Johnson, 2005). A key limitation is the exclusion of consumers with past or present comorbidity from clinical trials exploring addiction or mental illness, despite representing the majority of those with either mental illness or addiction disorders (Adams et al., 2007; Book et al., 2008; Tarrier & Sommerfield, 2003).
The Qualitative Approach

There is a paucity of qualitative research in the field of comorbidity in general, where we might seek answers that are driven by a search for understanding, as opposed to measuring, by exploration rather than confirmation, and by accessing the vast store of knowledge and experience held by consumers as a means of informing research: the need for qualitative data collection from consumers (and their families and carers) is identified as a major deficiency in research in the field (Coombes & Wratten, 2007; Green & Thorogood, 2004; Staiger et al., 2011).

In the qualitative literature that is available, there is a focus on high severity and low prevalence conditions (Healey et al., 2009; Strickler et al., 2009; Ward, 2011; Weinberg & Koegel, 1996) and a range of methodological limitations apparent. Although the novel exploration of the views of comorbidity consumers in Australia by Staiger et al. in 2011 unveiled some key issues, this promising study unfortunately experienced the loss of two thirds of all audio data prior to transcription and is also limited to a 12-month timeframe: a short period of time in the context of comorbidity and recovery (Staiger et al., 2011).

An unclear degree of reflexivity by researchers is a common problem, with an absence of elucidation of researcher assumptions or a positioning of the researcher in the study, or to clarify the fundamental epistemological perspectives or professional roles of the interviewers (Healey et al., 2009; Staiger et al., 2011; Wadell & Skarsater, 2007). Notwithstanding debate in the literature regarding the value, methodology, and risks of member checking (Goldblatt, Kamieli-Miller, & Neumann, 2011; Julie, 2010), a lack of iterative feedback to participants is a potential flaw in research in this area and the rationale when excluding member checking is only occasionally considered (Coombes & Wratten, 2007; Staiger et al., 2011; Strickler et al., 2009; Wadell & Skarsater, 2007). As with reflexivity, this can be a conspicuous absence when not explicitly addressed by the researcher.

How Can We Move Forward?

There are a number of gaps in our understanding evident from this review. There has been little previous research investigating how comorbidity rates differ between different combinations of mental illness and addiction disorders, and addressing the distinctions and transitions between nonuse, use, light use, and disordered or dependent use would add to knowledge (Mills et al., 2009; Swendsen et al., 2010). It seems a reasonable possibility that in Australia, for instance, with its culture of near ubiquitous alcohol use, the transition from “use of alcohol” to “dependence or problematic use” may be more useful than “use” and “nonuse” as dichotomous categories.

There is some evidence of significant differences between different comorbidity combinations (notably in regard to different mental illnesses) in clinical outcomes and in regard to social, psychological, and cultural demographics (Brems, Johnson, Burns, & Kletti, 2006). We need to understand this better. There is a need to explore what underlies the high attrition rates in comorbidity treatment and a need for research looking at how organizational characteristics of service providers relate to outcomes (Sabrina Janine et al., 2010).

The minimum data set for residential and community addiction services in Australia does not require collection of any data illuminating mental health comorbidity (AIHW, 2011). Instituting collection of this data will provide opportunities for advances in research into comorbidity and improved consumer outcomes. A focus on lifetime comorbidity rather than limiting to an arbitrary 12-month period would add to knowledge and understanding; of the 45% in the general population who appear to have a lifetime episode of mental illness, most will not have had symptoms within the past 12 months (Australian Bureau of Statistics, 2007).

There is scope for significant benefit to grow from early intervention and prevention strategies targeted at those with mental illness, to protect against the development of substance disorder comorbidities, and vice versa (Teesson et al., 2009). Regardless of issues of causality or temporal course, the strong associations indicate that there is scope for targeting secondary preventative interventions after an initial diagnosis—knowing that most will develop comorbidity in their lifetime (Kessler, 2004a).

How much can we rely on our current body of evidence-based research—when our classifications and categorizations are based on consensus and debate—but not on empirical evidence and in the absence of meaning (Cosci & Fava, 2011)? To move forward productively, one suggestion is to use qualitative approaches to interpret statistical data in a new way, as a way forward in our understanding, as opposed to measurement without meaning (Thylstrup & Johansen, 2009).

A 2011 systematic review of treatment satisfaction in comorbidity consumers (limited to quantitative studies) found that integrated comorbidity treatment produced greater consumer satisfaction, notably more so than symptom severity or socioeconomic status factors—further research in the area of treatment satisfaction is explicitly needed (Fallot, McHugo, Harris, & Xie, 2011; Schulte et al., 2011). The notions surrounding Verstehen are critically important here: of understanding action and attributed meaning from the unique perspective of the individual and in regard to social meaning (Herva, 1988; Weber, Gerth, & Mills, 1946). It is clear that there is a need to understand the consumer perspective better and a need for greater awareness of how professional advice is modified (in regard to what is heard, and what is acted on) by the unique and specific individual experiences around mental illness and harmful alcohol or drug use (Healey et al., 2009). Rarely (if ever) is the question even asked: How do consumers define comorbidity? On the basis of a clinically diagnosed illness? On the basis of having...
sought help, professionally or from peers? On the basis of life impact, with priorities highly individual, culturally diverse, and not always agreeing with the DSM or ICD? It is a notable flaw that consumers and their families are not considered potential experts in their own conditions (Tiet & Mausbach, 2007).

**Conclusion**

In summary, this article provides, to the best of our knowledge, a unique examination and interpretation of the comorbidity of mood or anxiety disorders and alcohol problems. Recovery (whether rebuilding, reshaping, integrating or simply coping) is a complex tapestry. This serves as a call to move beyond reductionist hegemonies and the constraints of historically entrenched viewpoints. We have the opportunity to rebuild our paradigms of mental illness and addiction on an evolving foundation with, perhaps, the consumer perspective as our starting point. Put simply, we cannot find what we are not looking for, and we cannot find answers without knowing the questions to ask. It is unlikely that there are easy answers or a distilled biological solution just beyond our reach. It is possible that we are following misguided paths, leading us deeper into the jungle—we need to continue to examine this jungle from above, certainly, but we also need to learn from those who have tread the treacherous paths concealed beneath the canopy.

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**References**

Adams, D. H., Liu-Seifert, H., & Kinon, B. J. (2007). Dual diagnosis patients in clinical trials of antipsychotics. *Journal of Dual Diagnosis, 3*(2), 73-83.

Alegria, A. A., Hasin, D. S., Nunes, E. V., Liu, S.-M., Davies, C., Grant, B. F., & Blanco, C. (2010). Comorbidity of generalized anxiety disorder and substance use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry, 71*, 1187-1195.

Alcoholics Anonymous World Services, Inc. (2001). *The big book* (4th ed.). Retrieved from http://www.aa.org/bigbookonline.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Angela, L. R., Sheila, J. O. N., Kristin, E. D., & Timothy, S. D. (2005). Special section on relapse prevention: Substance abuse relapse and factors associated with relapse in an inner-city sample of patients with dual diagnoses. *Psychiatric Services, 56*, 1274-1281.

Anthony, F. L., Myers, C. P., Corty, E., & James, W. T. (1994). Prevalence and patterns of “dual diagnosis” among psychiatric inpatients. *Comprehensive Psychiatry, 35*, 106-112.

Antony, R. W. (2011). Characteristics of three consumer cohorts in vocational rehabilitation: A comparison of consumers with dual-diagnosis, psychiatric, or substance use related disorders. *Journal of Applied Rehabilitation Counseling, 42*(1), 15.

Arias, A. J., & Kranzler, H. R. (2008). Treatment of co-occurring alcohol and other drug use disorders. *Alcohol Research & Health, 31*(2), 155-167.

Australian Bureau of Statistics. (2007). *National Survey of Mental Health and Wellbeing* (Report No. 4326.0). Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/mf/4326.0

Australian Institute for Health and Welfare. (2009). *Australia’s Health 2008* (Cat No. AUS 99). Canberra, Australia: Author.

Australian Institute for Health and Welfare. (2010). *Australia’s Health 2010* (Cat No. AUS 122). Canberra, Australia: Author.

Australian Institute of Health and Welfare. (2011). *Alcohol and other drug treatment services* (National Minimum Data Set 2011-2012). Canberra, Australia: Author. Retrieved from http://meteor.aihw.gov.au/content/index.pltmlid/427037

Bachmann, K. M., Moggi, F., Hirsbrunner, H. P., Donati, R., & Brodbuck J. (1997). An integrated treatment program for dually diagnosed patients. *Psychiatric Services, 48*(3), 314-316.

Back, S. E., Brady, K. T., Sonne, S. C., & Verduin, M. L. (2006). Symptom improvement in co-occurring PTSD and alcohol dependence. *The Journal of Nervous and Mental Disease, 194*, 690-696.

Balsiger, P. W. (2004). Supradisciplinary research practices: History, objectives and rationale. *Futures, 36*, 407-421. doi:10.1016/j.futures.2003.10.002

Barry, K. R., Tidway, J. A., & Blissett, J. (2002). Staff drug knowledge and attitudes towards drug use among the mentally ill within a medium secure psychiatric hospital. *Journal of Substance Use, 7*, 50-56.

Batki, S. L., Meszaros, Z. S., Strutynski, K., Dimmock, J. A., Leontieva, L., Ploutz-Snyder, R., . . . Drayer, R. A. (2009). Medical comorbidity in patients with schizophrenia and alcohol dependence. *Schizophrenia Research, 107*, 139-146.

Belin, D., & Everitt, B. J. (2008). Cocaine seeking habits depend upon dopamine-dependent serial connectivity linking the ventral with the dorsal striatum. *Neuron, 57*, 432-441. doi:10.1016/j.neuron.2007.12.019

Bogenschutz, M., & Akin, S. (2000). 12-step participation and attitudes toward 12-step meetings in dual diagnosis patients. *Alcoholism Treatment Quarterly, 18*(4), 31-45.

Bogenschutz, M., Geppert, C. M. A., & George, J. (2006). The role of twelve-step approaches in dual diagnosis treatment and recovery. *American Journal on Addictions, 15*, 50-60.

Book, S. W., Thomas, S. E., Randall, P. K., & Randall, C. L. (2008). Paroxetine reduces social anxiety in individuals with a co-occurring alcohol use disorder. *Journal of Anxiety Disorders, 22*, 310-318.

Boschloo, L., Vogelzangs, N., Smit, J. H., van den Brink, W., Veltman, D. J., Beekman, A. T., & Penninx, B. W. (2011). Comorbidity and risk indicators for alcohol use disorders among persons with anxiety and/or depressive disorders: Findings from the Netherlands Study of Depression and Anxiety (NESDA). *Journal of Affective Disorders, 131*, 233-242.
Bradizza, C. M., Stasiewicz, P. R., & Paas, N. D. (2006). Relapse to alcohol and drug use among individuals diagnosed with co-occurring mental health and substance use disorders: A review. *Clinical Psychology Review, 26*, 162-178.

Brady, K. T. (2005). Pharmacotherapy of comorbid mood, anxiety, and substance use disorders. *Substance Use & Misuse, 40*, 2021-2028.

Brady, S., Hiam, C. M., Saemann, R., Humbert, L., Fleming, M. Z., & Dawkins-Brickhouse, K. (1996). Dual diagnosis: A treatment model for substance abuse and major mental illness. *Community Mental Health Journal, 32*, 573-578.

Brems, C., Johnson, M., Burns, R., & Kletti, N. (2006). Dual diagnosis variations across differing comorbid diagnoses. *Journal of Dual Diagnosis, 2*(3), 109-129.

Brooks, A., & Penn, P. (2003). Comparing treatments for dual diagnosis: Twelve-step and Self-Management and Recovery Training. *The American Journal of Drug and Alcohol Abuse, 29*, 359-383.

Bruce, G. L., Elmer, I. S., Michael, R., Jo, C. P., & Larry, N. (1997). On stigma and its consequences: Evidence from a longitudinal study on men with dual diagnoses of mental illness and substance abuse. *Journal of Health and Social Behavior, 38*, 177-190.

Buckley, P. (2007). Dual diagnosis of substance abuse and severe mental illness: The scope of the problem. *Journal of Dual Diagnosis, 3*(2), 59-62.

Canaway, R., & Merkes, M. (2010). Barriers to comorbidity service delivery: The complexities of dual diagnosis and the need to agree on terminology and conceptual frameworks. *Australian Health Review, 34*, 262-268.

Chambers, R. A. (2008a). Impulsivity, dual diagnosis, and the structure of motivated behavior in addiction. *Behavioral and Brain Sciences, 31*, 443-444.

Chambers, R. A. (2008b). What’s in a name: “Dual diagnosis” vs. “co-occurring disorders.” *Journal of Dual Diagnosis, 4*(2), 197-200.

Chang, C.-K., Hayes, R. D., Perera, G., Broadbent, M. T. M., Fernandes, A. C., Lee, W. E., & Stewart, R. (2011). Life expectancy at birth for people with serious mental illness and other major disorders from a secondary mental health care case register in London. *PLoS ONE, 6*(5), e19590. doi:10.1371/journal.pone.0019590

Chappell, J. N., & DuPont, R. L. (1999). Twelve-step and mutual-help programs for addictive disorders. *Psychiatric Clinics of North America, 22*, 425-446.

Colton, C. W., & Manderscheid, R. W. (2006). Congruencies in increased mortality rates, years of potential life lost, and causes of death among public mental health clients in eight states. *Preventing Chronic Disease, 3*(2), A42.

Conklin, J. (2005). Dialogue mapping: Building shared understanding of wicked problems. Chichester, UK: John Wiley.

Coombs, L., & Wratten, A. (2007). The lived experience of community mental health nurses working with people who have dual diagnosis: A phenomenological study. *Journal of Psychiatric and Mental Health Nursing, 14*, 382-392.

Cosci, F., & Fava, G. A. (2011). New clinical strategies of assessment of comorbidity associated with substance use disorders. *Clinical Psychology Review, 31*, 418-427. doi:10.1016/j.cpr.2010.11.004

Crawford, V., Crome, I. B., & Clancy, C. (2003). Co-existing problems of mental health and substance misuse (dual diagnosis): A literature review. *Drugs: Education, Prevention and Policy, 10*, 1-74.

Degenhardt, L. (2008). Toward a global view of alcohol, tobacco, cannabis, and cocaine use: Findings from the WHO World Mental Health Surveys. *PLoS Medicine, 5*(7), Article 141.

Dickey, B., & Azeni, H. (1996). Persons with dual diagnoses of substance abuse and major mental illness: Their excess costs of psychiatric care. *American Journal of Public Health, 86*, 973-977.

Drake, R. E. (2000). Dual diagnosis: 15 years of progress. *Psychiatric Services, 51*, 1126-1129.

Drake, R. E. (2007). Dual diagnosis. *Psychiatry, 6*(9), 381-384.

Drake, R. E., & Mueser, K. T. (1996). *Alcohol Health and Research World, 20*(2), 86(8).

Drake, R. E., & Mueser, K. T. (2000). Psychosocial approaches to dual diagnosis. *Schizophrenia Bulletin, 26*, 105-118.

Drake, R. E., Osher, F., & Wallach, M. (1991). Homelessness and dual diagnosis. *The American Psychologist, 46*, 1149-1158.

Driessen, M., Veltrup, C., Weber, J., John, U., Wetterling, T., & Dilling, H. (1998). Psychiatric co-morbidity, suicidal behaviour and suicidal ideation in alcoholics seeking treatment. *Addiction, 93*, 889-894.

Eisenberg, L. (1986). Mindlessness and brainlessness in psychiatry. *The British Journal of Psychiatry, 148*, 497-508. doi:10.1192/bjp.148.5.497

Elspeth, M. M., Marni, L., Simone, P., Chris, T., Janne Maree, B., Neil, C., & Peter, S. (2004). Social networks of people with dual diagnosis: The quantity and quality of relationships at different stages of substance use treatment. *Community Mental Health Journal, 40*, 451-464.

Fallot, R. D. (2005). Integrated trauma services teams for women survivors with alcohol and other drug problems and co-occurring mental disorders. *Alcoholism Treatment Quarterly, 22*(3-4), 181-199.

Fallot, R. D., McElroy, G. J., Harris, M., & Xie, H. (2011). The trauma recovery and empowerment model: A quasi-experimental effectiveness study. *Journal of Dual Diagnosis, 7*, 74-89. doi:10.1080/15504263.2011.566056

Farren, C. K. (2011). Gender differences in outcome at 2-year follow-up of treated bipolar and depressed alcoholics [Supplement]. *Journal of Studies on Alcohol and Drugs, 72*(5), Article 872.

Farren, C. K., & McElroy, S. (2010). Predictive factors for relapse after an integrated inpatient treatment programme for unipolar depressed and bipolar alcoholics [Comparative Study Research Support, Non-U.S. Gov’t]. *Alcohol & Alcoholism, 45*, 527-533.

Frances, R., & Suzette, M. E. (2001). Dual diagnosis: Where we are and where we are heading. *Psychiatric Annals, 31*(4), 241-242.

Frigola, N. E., Fonseca, F., Mateu, G., Castillo, C., & Torrens, M. (2008). Dual diagnosis in an inpatient detoxification unit: A follow-up study. *European Neuropsychopharmacology, 18*, (Suppl. 4), S550. doi:10.1016/s0924-977x(08)70836-8

Galanter, M. (2006). Spirituality and addiction: A research and clinical perspective. *American Journal on Addictions, 15*, 286-292.

Gimelfarb, Y., Natan, Z., & Baruch, Y. (2007) Suicide in dual diagnosis patients. *European Psychiatry, 22* (Supplement 1), S193-S194.
Goldblatt, H., Karnieli-Miller, O., & Neumann, M. (2011). Sharing qualitative research findings with participants: Study experiences of methodological and ethical dilemmas. Patient Education and Counseling, 82, 389-395. doi:10.1016/j.pec.2010.12.016

Gorski, T. (1994). A suggestion for conceptualizing dual diagnosis. Behavioral Health Management, 14(2), 50.

Granholm, E., Anthenelli, R., Monteiro, R., Sevcik, J., & Stoler, M. (2003). Brief integrated outpatient dual-diagnosis treatment reduces psychiatric hospitalizations. American Journal on Addictions, 12, 306-313.

Green, J., & Thorogood, N. (2004). Qualitative methods for health research. London, England: Sage.

Griffiths, M. D. (2008). The biopsychosocial and “complex” systems approach as a unified framework for addiction. Behavioral and Brain Sciences, 31, 446-447.

Hardcastle, V. G. (2008). Neither necessary nor sufficient for addiction. Behavioral and Brain Sciences, 31, 447-448.

Hart, C. L., & Krauss, R. M. (2008). Human drug addiction is more than faulty decision-making. Behavioral and Brain Sciences, 31, 448-449.

Hawke, J. M., Ford, J. D., Kaminer, Y., & Burke, R. (2009). Trauma and PTSD among youths in outpatient treatment for alcohol use disorders. Journal of Child & Adolescent Trauma, 2, 1-14.

Healey, C., Peters, S., Kinderman, P., McCracken, C., & Morriss, R. (2009). Reasons for substance use in dual diagnosis bipolar disorder and substance use disorders: A qualitative study. Journal of Affective Disorders, 113, 118-126.

Herva, S. (1988). The genesis of Max Weber’s verstehende soziologie. Acta Sociologica, 31, 143-156.

Horsfall, J., Cleary, M., Hunt, G., & Walter, G. (2009). Psychosocial treatments for people with co-occurring severe mental illnesses and substance use disorders (dual diagnosis): A review of empirical evidence. Harvard Review of Psychiatry, 17, 24-34.

Howard, J., Stubbs, M., & Arcuri, A. (2007). Comorbidity: Coexisting substance use and mental disorders in young people. Clinical Psychologist, 11, 88-97.

Hughes, E., Wanigaratne, S., Gournay, K., Johnson, S., Thorneycroft, G., Finch, E., . . . Smith, N. (2008). Training in dual diagnosis interventions (the COMO Study): Randomised controlled trial. BMC Psychiatry, 8, Article 12.

International Committee of Medical Journal Editors. (2010). Uniform requirements for manuscripts submitted to biomedical journals. Retrieved from http://www.icmje.org/urm_full.pdf

Iovieno, N., Tedeschi, E., Bentley, K. H., Ewins, A. E., & Papakostas, G. I. (2011). Antidepressants for major depressive disorder and dysthmic disorder in patients with comorbid alcohol use disorders: A meta-analysis of placebo-controlled randomized trials [Meta-Analysis Research Support, Non-U.S. Gov’t]. Journal of Clinical Psychiatry, 72, 1144-1151.

Jane-Llopis, E., & Matysinska, I. (2006). Mental health and alcohol, drugs and tobacco: A review of the comorbidity between mental disorders and the use of alcohol, tobacco and illicit drugs [Review]. Drug & Alcohol Review, 25, 515-536.

Jellinek, E. M. (1960). The disease concept of alcoholism. Highland Park, NJ: Hillhouse Press.

Jerrell, J., Hu, T.-W., & Ridgely, M. (1994). Cost-effectiveness of substance disorder interventions for people with severe mental illness. The Journal of Behavioral Health Services and Research, 21, 283-297. doi:10.1007/bf02521335

Johnson, E. O. S. L. (2005). Forward telescoping bias in reported age of onset: An example from cigarette smoking [Article]. International Journal of Methods in Psychiatric Research, 14, 119-129. doi:10.1002/mpr.2

Julie, A. C. (2010). Avoiding traps in member checking. The Qualitative Report, 15, 1102-1113.

Karen Leigh, E., & Ian, M. (2009). Nursing considerations for dual diagnosis in mental health. International Journal of Nursing Practice, 15, 74-79.

Kay-Lambkin, F., Baker, A., & Lewin, T. (2004). The “co-morbidity roundabout”: A framework to guide assessment and intervention strategies and engineer change among people with co-morbid problems. Drug & Alcohol Review, 23, 407-423.

Kelly, T. M., Daley, D. C., & Douaihy, A. B. (2012). Treatment of substance abusing patients with comorbid psychiatric disorders. Addictive Behaviors, 37, 11-24. doi:10.1016/j.addbeh.2011.09.010

Kenny, A., Kidd, S., Tuena, J., Jarvis, M., & Robertson, A. (2006). Falling through the cracks: Supporting young people with dual diagnosis in rural and regional Victoria. Australian Journal of Primary Health, 12(3), 12-19.

Kessler, R. C. (1997). Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the national comorbidity survey. Archives of general psychiatry, 54, 313-321.

Kessler, R. C. (2004a). The epidemiology of dual diagnosis. Biological Psychiatry, 56, 730-737.

Kessler, R. C. (2004b). The world mental health (WMH) survey initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). International Journal of Methods in Psychiatric Research, 13, 93-121.

Keyser, D. J., Watkins, K. E., Vilamowska, A.-M., & Pincus, H. A. (2008). Focus on alcohol & drug abuse: Improving service delivery for individuals with co-occurring disorders: New perspectives on the quadrant model [Research Support, U.S. Gov’t, P. H. S.]. Psychiatric Services, 59, 1251-1253.

Koford, L. (1993). Alcoholism and drug abuse in patients with PTSD. Psychiatric Quarterly, 64, 151-171.

Kötter, R., & Balsiger, P. W. (1999). Interdisciplinarity and transdisciplinarity: A constant challenge to the sciences. Issues in Integrative Studies, 17, 87-120.

Kuo, P.-H., Gardner, C. O., Kendler, K. S., & Prescott, C. A. (2006). The temporal relationship of the onsets of alcohol dependence and major depression: Using a genetically informative study design. Psychological Medicine, 36, 1153-1162. doi:10.1017/S0033291706007860

Laudet, A. B., Magura, S., Vogel, H. S., & Knight, E. (2000). Recovery challenges among dually diagnosed individuals. Journal of Substance Abuse Treatment, 18, 321-329. doi:10.1016/s0740-5472(99)00077-x

Lawrence-Jones, J. (2010). Dual diagnosis (drug/alcohol and mental health): Service user experiences. Practice: Social Work in Action, 22, 115-131.

Le Fauve, C. E., Litten, R. Z., Randall, C. L., Moak, D. H., Salloum, I. M., & Green, A. I. (2004). Pharmacological treatment of alcohol abuse/dependence with psychiatric comorbidity [Congresses Research Support, Non-U.S. Gov’t Research Support, U.S. Gov’t, P. H. S.]. Alcoholism: Clinical & Experimental Research, 28, 302-312.
Lyman, A. (2010). Experienced clinicians’ perspectives on dual diagnosis: A qualitative investigation (Doctoral dissertation). California Institute of Integral Studies. Retrieved from http://gradworks.umi.com/34/34/3434795.html

Maremmani, A. G. I., Dell’Osso, L., Pacini, M., Popovic, D., Rovai, L., Torrens, M., . . . Maremmani, I. (2011). Dual diagnosis and chronology of illness in treatment-seeking Italian patients dependent on heroin. Journal of Addictive Diseases, 30, 123-135.

Marquenie, L. A., Schade, A., van Balkom, A. J., Comijs, H. C., de Graaf, R., Vollebergh, W., . . . van den Brink, W. (2006). Origin of the comorbidity of anxiety disorders and alcohol dependence: Findings of a general population study. European Addiction Research, 13, 39-49.

Marshall, J. (1998). Dual diagnosis: Co-morbidity of severe mental illness and substance misuse. Journal of Forensic Psychiatry, 9, 9-15.

McCray, A. T., & Ide, N. C. (2000). Design and implementation of a National Clinical Trials Registry. Journal of the American Medical Informatics Association, 7, 313-323. doi:10.1136/jamia.2000.0070313

McKeown, M., Stowell Smith, M., Derricott, J., & Mercer, D. (1998). Dual diagnosis as social control. Addiction Research, 6, 63-70.

McLaren, N. (2009). Science and the psychiatric publishing industry [Article]. Ethical Human Psychology & Psychiatry, 11, 29-36. doi:10.1891/1559-4343.11.1.29

McRae Clark, A., Verduin, M., Tolliver, B., Carter, R., Wahlquist, A., Brady, K., & Anderson, S. (2009). An open-label trial of aripiprazole treatment in dual diagnosis individuals: Safety and efficacy. Journal of Dual Diagnosis, 5, 83-96.

Miller, J., & Roache, J. (2009). Benefits of topiramate treatment in a dual-diagnosis patient. Psychosomatics, 50, 426-427. doi:10.1176/appi.ps.50.4.426

Mills, K., Deady, M., Proudfoot, H., Sannibale, C., Teesson, M., Mattick, R., & Burns, L. (2009). Guidelines on the management of co-occurring alcohol and other drug and mental health conditions in alcohol and other drug treatment settings. National Drug and Alcohol Research Centre, University of New South Wales, Sydney. Retrieved from http://ndarc.med.unsw.edu.au/resource/comorbidity-guidelines-full-document

Minkoff, K. (2001). Best practices: Developing standards of care for individuals with co-occurring psychiatric and substance use disorders. Psychiatric Services, 52, 456-458.

Moffitt, T. E., Caspi, A., Taylor, A., Kokaua, J., Milne, B. J., Polanczyk, G., & Poulton, R. (2010). How common are common mental disorders? Evidence that lifetime prevalence rates are doubled by prospective versus retrospective ascertainment. Psychological Medicine, 40, 899-909. doi:10.1017/S0033291709991036

Moggi, F., Brodbeck, J., Költzsch, K., Hirsbrunner, H. P., & Bachmann, K. M. (2002). One-year follow-up of dual diagnosis patients attending a 4-month integrated inpatient treatment. European Addiction Research, 8, 30-37.

Moggi, F., Ouiemte, P. C., Finney, J. W., & Moos, R. H. (1999). Effectiveness of treatment for substance abuse and dependence for dual diagnosis patients: A model of treatment factors associated with one-year outcomes. Journal of Studies on Alcohol and Drugs, 60, 856-866.

Mortlock, K. S., Deane, F. P., & Crowe, T. P. (2011). Screening for mental disorder comorbidity in Australian alcohol and other drug residential treatment settings. Journal of Substance Abuse Treatment, 40, 397-404.

Mowbray, C. T, Jordan, L. C., Ribisl, K. M., Kewalramani, A., Luke, D., Herman, S., & Bybee, D. (1999). Analysis of postdischarge change in a dual diagnosis population. Health & Social Work, 24, 91-101.

Mueser, K. T, Drake, R., & Wallach, M. (1998). Dual diagnosis: A review of etiological theories. Addictive Behaviors, 23, 717-734.

Mueser, K. T., Glynn, S. M., Cather, C., Zarate, R., Fox, L., Feldman, J., & Clark, R. E. (2009). Family intervention for co-occurring substance use and severe psychiatric disorders: Participant characteristics and correlates of initial engagement and more extended exposure in a randomized controlled trial. Addictive Behaviors, 34, 867-877. doi:10.1016/j.addbeh.2009.03.025

Neal, D. T., & Wood, W. (2008). Linking addictions to everyday habits and plans. Behavioral and Brain Sciences, 31, 455-456.

Ngo, H. T., Tait, R. J., & Hulse, G. K. (2011). Hospital psychiatric comorbidity and its role in heroin dependence treatment outcomes using naltrexone implant or methadone maintenance. Journal of Psychopharmacology, 25, 774-782. doi:10.1177/0269881110364266

Niv, N., Lopez, S. R., Glynn, S. M., & Mueser, K. (2007). The role of substance use in families’ attributions and affective reactions to their relative with severe mental illness. The Journal of Nervous and Mental Disease, 195, 307-314.

Nunes, E. V., & Levin, F. R. (2004). Treatment of depression in patients with alcohol or other drug dependence. The Journal of the American Medical Association, 291, 1887-1896. doi:10.1001/jama.291.15.1887

Ogloff, J. R. P., Lempers, A., & Dwyer, C. (2004). Dual diagnosis in an Australian forensic psychiatric hospital: Prevalence and implications for services. Behavioral Sciences & the Law, 22, 543-562.

Onken, S. J. (2007). An analysis of the definitions and elements of recovery: A review of the literature. Psychiatric Rehabilitation Journal, 31, 9-22.

Ouiemte, P., Wolfe, J., & Chestman, K. R. (1996). Characteristics of posttraumatic stress disorder: Alcohol abuse comorbidity in women. Journal of Substance Abuse, 8, 335-346.

Padgett, D. K., Gulcur, L., & Tsemberis, S. (2006). Housing first services for people who are homeless with co-occurring serious mental illness and substance abuse. Research on Social Work Practice, 16, 74-83.

Palmieri, C. D., & Accordini, M. P. (2004). Dual diagnosis: Effective treatment and barriers to recovery. Journal of Applied Rehabilitation Counseling, 35(4), 35-41.

Pettinati, H. M., Oslin, D. W., Kampman, K. M., Dundon, W. D., Xie, H., Gallis, T. L., & O’Brien, C. P. (2010). A double-blind,
placebo-controlled trial combining sertraline and naltrexone for treating co-occurring depression and alcohol dependence. *American Journal of Psychiatry*, 167, 668-675.

Phillips, P. (1998). The mad, the bad, and the dangerous—Harm reduction in dual diagnosis. *International Journal of Drug Policy*, 9, 345-349.

Phillips, P. (2007). Dual diagnosis: An exploratory qualitative study of staff perceptions of substance misuse among the mentally ill in Northern India. *Issues in Mental Health Nursing*, 28, 1309-1322.

Phillips, P., & Labrow, J. (2000). Dual diagnosis—Does harm reduction have a role? *International Journal of Drug Policy*, 11, 279-283.

Pietrzak, R. (2011). Prevalence and axis I comorbidity of full and partial posttraumatic stress disorder in the United States: Results from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Anxiety Disorders*, 25, 456-465.

Powel, T., & Kurtz, L. (1996). A model of AA utilization by persons with a dual diagnosis. *Contemporary Drug Problems*, 23(1), 139-157.

Prayle, A. P., Hurley, M. N., & Smyth, A. R. (2012). Compliance with mandatory reporting of clinical trial results on ClinicalTrials.gov: Cross sectional study. *BMJ*, 2012, Article 344, doi:10.1136/bmj.d7373

Ramón, S. (2009). The rediscovered concept of recovery in mental illness. *International Journal of Mental Health*, 38, 106-126.

Redish, A. D. (2008). A unified framework for addiction: Vulnerabilities in the decision process. *Behavioral and Brain Sciences*, 31, 415-437.

Robert, E. D., & Kim, T. M. (2000). Psychosocial approaches to dual diagnosis. *Schizophrenia Bulletin*, 26, 105-118.

Sabrina Janine, S., Petra Sylvia, M., John, S., & Mike, B. (2010). Unrecognised dual diagnosis: A risk factor for dropout of addiction treatment. *Mental Health and Substance Use*, 3, 94-109.

Sainfort, F., Becker, M., & Diamond, R. (1996). Judgments of quality of life of individuals with severe mental disorders: Patient self-report versus provider perspectives. *The American Journal of Psychiatry*, 153, 497-502.

Saladin, M. E., Brady, K. T., Dansky, B. S., & Kilpatrick, D. G. (1995). Understanding comorbidly between PTSD and substance use disorders: Two preliminary investigations. *Addictive Behaviors*, 20, 643-665, doi:10.1016/0306-4603(95)00024-7

Salloum, I. (2005). Efficacy of valproate maintenance in patients with bipolar disorder and alcoholism: A double-blind placebo-controlled study. *Archives of general psychiatry*, 62, 37-45.

Salo, R., Flower, K., Kielstein, A., Leamon, M. H., Nordahl, T. E., & Galloway, G. P. (2011). Psychiatric comorbidity in methamphetamine dependence. *Psychiatry Research*, 186, 356-361. doi:10.1016/j.psychres.2010.09.014

Schmidt, L. (1991). Specialization in alcoholism and mental health residential treatment: The “dual diagnosis” problem. *Journal of Drug Issues*, 21, 859-874.

Schmidt, L. M., Hesse, M., & Lykke, J. (2011). The impact of substance use disorders on the course of schizophrenia: A 15-year follow-up study—Dual diagnosis over 15 years. *Schizophrenia Research*, 130, 228-233. doi:10.1016/j.schres.2011.04.011

Schulte, S., Meier, P., & Stirling, J. (2011). Dual diagnosis clients’ treatment satisfaction: A systematic review. *BMC Psychiatry*, 11(1), 64-75.

Shulman, G. (1995). Reorienting CD treatment for dual diagnosis. *Behavioral Health Management*, 15(5), 30.

Song, F., Parekh, S., Hooper, L., Loke, Y. K., Ryder, J., Sutton, A. J., & Harvey, I. (2010). Dissemination and publication of research findings: An updated review of related biases. *Health Technology Assessment*, 14(8), 1-193

Staiger, P., Thomas, A., Ricciardelli, L., McCabe, M., Cross, W., & Young, G. (2011). Improving services for individuals with a dual diagnosis: A qualitative study reporting on the views of service users. *Addiction Research & Theory*, 19, 47-55.

Strickler, D., Whitley, R., Becker, D., & Drake, R. (2009). First person accounts of long-term employment activity among people with dual diagnosis. *Psychiatric Rehabilitation Journal*, 32, 261-268.

Swedens, J., Conway, K. P., Degenhardt, L., Glantz, M., Jin, R., Merikangas, K. R., & Kessler, R. C. (2010). Mental disorders as risk factors for substance use, abuse and dependence: Results from the 10-year follow-up of the National Comorbidity Survey. *Addiction*, 105, 1117-1128. doi:10.1111/j.1360-0443.2010.02902.x

Tarrier, N., & Sommerfield, C. (2003). Alcohol and substance use in civilian chronic PTSD patients seeking psychological treatment. *Journal of Substance Use*, 8(4), 197-204.

Teesson, M., Slade, T., & Mills, K. (2009). Comorbidity in Australia: Findings of the 2007 National Survey of Mental Health and Wellbeing, *Australian and New Zealand Journal of Psychiatry*, 43, 606-614.

Thomas, S. E., Randall, P. K., Book, S. W., & Randall, C. L. (2008). A complex relationship between co-occurring social anxiety and alcohol use disorders: What effect does treating social anxiety have on drinking? [Randomized Controlled Trial Research Support, N. I. H., Extramural]. *Alcoholism: Clinical & Experimental Research*, 32, 77-84.

Thombs, B. D., Arthur, E., El-Baalbaki, G., Mejia, A., Ziegelstein, R. C., & Steele, R. J. (2011). Risk of bias from inclusion of patients who already have diagnosis of or are undergoing treatment for depression in diagnostic accuracy studies of screening tools for depression. *Systematic Review British Medical Journal*, 2011, Article 343, 1-11.

Thylstrup, B., & Johansen, K. (2009). Dual diagnosis and psychosocial interventions—Introduction and commentary. *Nordic Journal of Psychiatry*, 63, 202-208.

Tiet, Q., & Mausbach, B. (2007). Treatments for patients with dual diagnosis: A review. *Alcoholism: Clinical and Experimental Research*, 31, 513-536.

Torrens, M., Fonseca, F., Mauet, G., & Farré, M. (2005). Efficacy of antidepressants in substance use disorders with and without comorbid depression: A systematic review and meta-analysis. *Drug and Alcohol Dependence*, 78, 1-22. doi:http://dx.doi.org/10.1016/j.drugalcdep.2004.09.004

Tracy, E. M., & Johnson, P. J. (2007). Personal social networks of women with co-occurring substance use and mental disorders. *Journal of Social Work Practice in the Addictions*, 7, 69-90.

Tsemberis, S., Gulcur, L., & Nakae, M. (2004). Housing first, consumers with a dual diagnosis. *Contemporary Drug Problems*, 31, 1-11.

Wadell, K., & Skarsater, I. (2007). Nurses’ experiences of caring for patients with a dual diagnosis of depression and alcohol abuse in a general psychiatric setting. *Issues in Mental Health Nursing*, 28, 1125-1140.
Waghorn, G., Chant, D., & Jonsdottir, A. (2011). Comorbidity and labor force activity among people with psychiatric disorders. *Journal of Occupational and Environmental Medicine, 53*, 68-73.

Wakefield, J. C., Schmitz, M. F., & Baer, J. C. (2011). Did narrowing the major depression bereavement exclusion from DSM-III-R to DSM-IV increase validity? Evidence from the National Comorbidity Survey. *The Journal of Nervous and Mental Disease, 199*(2), 66-73.

Ward, T. D. (2011). The lived experience of adults with bipolar disorder and comorbid substance use disorder. *Issues in Mental Health Nursing, 32*, 20-27. doi:10.3109/01612840.2010.521620

Watts, T. D. (1982). Three traditions in social thought on alcoholism. *Substance Use & Misuse, 17*, 1231-1239. doi:10.3109/10826088209056351

Weaver, T., Madden, P., Charles, V., Stimson, G., Renton, A., & Tyrer, P., & M. I. C. Team. (2003). Comorbidity of substance misuse and mental illness in community mental health and substance misuse services. *The British Journal of Psychiatry, 183*, 304-313. doi:10.1192/02-623

Weber, M., Gerth, H. H., & Mills, C. W. (1946). From Max Weber: *Essays in sociology*. New York, NY: Oxford University Press.

Weinberg, D., & Koege, P. (1996). Social model treatment and individuals with dual diagnoses: An ethnographic analysis of therapeutic practice. *Journal of Mental Health Administration, 23*, 272-287.

Whitemore, R., & Knaf, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing, 52*, 546-553. doi:10.1111/j.1365-2648.2005.03621.x

Wisniewski, S. (2009). Can phase III trial results of antidepressant medications be generalized to clinical practice? A STAR*D report. *The American Journal of Psychiatry, 166*, 599-607.

Withers, N. W., & Hirsch, K. A. (2003). Dual diagnosis and suicide. *Journal of Psychosomatic Research, 55*(2), p. 159.

World Health Organisation. (2011). *Global status report on alcohol and health*. Geneva, Switzerland: Author. Retrieved from http://www.who.int/substance_abuse/publications/global_alcohol_report/en/index.html

World Health Organisation. (2012). *International clinical trial registries platform*. Geneva, Switzerland: Author. Retrieved from http://www.who.int/ictrp/network/primary/en/index.html

Wright, S., Gournay, K., Glorney, E., & Thornicroft, G. (2002). Mental illness, substance abuse, demographics and offending: Dual diagnosis in the suburbs. *Journal of Forensic Psychiatry, 13*, 35-52.

Xie, H., Robert, E. D., Gregory, J. M., Lynn, X., & Anita, M. (2010). The 10-year course of remission, abstinence, and recovery in dual diagnosis. *Journal of Substance Abuse Treatment, 39*, 132-140.

Xiong Lai, H. M., & Qi Rong, H. (2009). Comorbidity of mental disorders and alcohol- and drug-use disorders: Analysis of New South Wales inpatient data. *Drug & Alcohol Review, 28*, 235-242.

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