Neurocognitive impairment, psychosocial stress, and functional adjustment in bipolar disorder: Implications for disability policy

Boaz Levy and Emily Manove
University of Massachusetts, Boston

Abstract

New research in bipolar disorder (BPD) has uncovered various factors that may account for the enduring functional impairment observed in people who experience the disorder. Neuroimaging studies point to abnormal reductions in brain volume related to age and illness duration. Consistent with these findings, studies employing neuropsychological measures reveal that cognitive dysfunction in BPD increases with a more severe course of illness. For many people with BPD, cognitive deficits linger into periods of euthymia, and correlate with psychosocial impairment. These studies collectively support a neurodegenerative model in which repeated exposure to mood disturbance leads to neurological impairment, cognitive decline and functional difficulties. In this respect, they highlight the importance of preventive care for preserving functional adjustment in BPD. Effective prevention will probably involve significant reductions in psychosocial stress, which remains among the strongest predictors of symptom recurrence in BPD. This paper discusses implications for disability policy.

Key words: bipolar disorder, cognitive deficits, disability policy.

Introduction

Bipolar disorder (BPD) is one of the top ten most disabling disorders in the world (1). Even during euthymia, BPD is often accompanied by extensive psychosocial disability (2-4). Longitudinal investigations indicate that up to 50% of people with BPD who are hospitalized for an acute episode experience poor post-hospital adjustment (5), and rarely regain premorbid functioning after the resolution of mood symptoms (6). During euthymia, many people with BPD report severe reductions on various measures of quality of life (7, 8), reflecting major struggles to meet the demands of daily tasks (9), fulfil expected family or community roles (10-12), and maintain occupational status commensurate with professional ability and education (13-17).

These findings, along with qualitative research, indicate that treatments targeting syndromal recovery are insufficient for restoring psychological well-being in many people who have BPD (18, 19). In addition, it is becoming increasingly clear that the acute presence of mood disturbance, albeit a significant contributing factor (20, 21), is not the only cause of functional impairment in BPD (13, 22-25).

Cognitive dysfunction and psychosocial impairment

Cognitive impairment appears to be one of the strongest predictors of psychosocial dysfunction in BPD, especially during euthymia (26, 27). Studies indicate that cognitive dysfunction exacerbates with acute symptoms (28); however, deficits in attention (29), memory (30), and executive functioning (31) linger into euthymia in many people, even in the absence of residual symptoms (32). Multiple studies have linked chronic cognitive impairment in BPD to functional difficulties, as indicated by diminished employment (33), pursuit of disability support (34, 35), challenges in completing tasks of daily living (36), inconsistent medication management (37), poor adherence to treatment (38), and marginalized social role (12, 39). There is also longitudinal evidence that cognitive deficits predict psychosocial adjustment one, two and even fifteen years after hospital discharge (39-42), suggesting that the

aetiology and course of functional impairment in BPD is related in part to cognitive dysfunction.

Brain abnormalities

Cognitive impairment in BPD is deemed to originate in abnormal brain structures. Several meta-analytic reviews of structural imaging studies document the presence of consistent structural anomalies in the brains of people with BPD (43-45). Genetic risk alone has been linked to neurobiological trait abnormalities in multiple studies, using various forms of examination (46-48). At illness onset, people with BPD show some enlargement of the lateral ventricles, associated with volume reductions in whole brain and total white matter (49). Volume reductions measured during the first manic episode appear to be more pronounced in white than in gray matter (50). Across various stages of the illness, gray matter reductions centre around paralimbic areas (i.e., the anterior cingulate and insula), which are involved in emotional processing (51). Additional studies documented an abnormally high presence of hyperintensities in the deep white matter and subcortical gray matter, potentially representing ischemic damage related to illness progression (52). Consistent with these observations, studies further indicate that reductions in whole brain and prefrontal lobe volumes relate to age and illness duration (45). In the absence of clear evidence of significant cognitive impairment before BPD onset (53, 54), these findings are consistent with a neurodegenerative hypothesis, which accounts for the accelerated cognitive decline observed in studies of people with a more severe course of illness (55, 56).

A small number of studies to date have attempted to relate morphological brain abnormalities directly to cognitive impairment in BPD (57-59). However, one of the studies in this category deserves particular attention due to its exceptionally rigorous methodology. In a four-year longitudinal study, Moorhead et al. (59) followed a group of people with BPD and a control group of people without psychiatric diagnoses with repeated imaging measurements, cognitive assessments, and clinical evaluations. Analyses indicated brain density reductions only in people with BPD, which were specific to gray matter in the cerebellar, fusiform, and hippocampal areas. The observed volume reductions in the temporal lobe related to both the number of acute mood episodes and changes in cognitive functioning that were recorded over the course of the study. The results of this study agree with the repeated observation that cognitive impairment occurs more frequently in people with BPD who suffer from a more severe course of illness (60). In this respect, this study provides some of the strongest support to date for an illness-related neurodegenerative process in BPD.

Evidence from functional neuroimaging studies generally indicates limbic hyperactivity and frontal hypo-activity during emotional and cognitive tasks in people with BPD (61). Other analyses confirm this abnormal frontal-limbic activation, indicating attenuated activation of the ventrolateral prefrontal cortex, and enhanced limbic activation (43). However, although euthymic patients exhibited hyperactivity in the limbic system, they did not show the hypo-frontal pattern during cognitive tasks (61). Thus, these studies may account for mood disturbance in BPD but they do not elucidate the neurological source of cognitive impairment in asymptomatic patients.

Genetics and psychosocial stress

Although no one gene has been identified as predictive of BPD with more than a small effect size (62), a large volume of studies point to a heritability rate for BPD ranging from 60 to 89% (63-66). Studies also indicate that genetics influence the age of onset and illness severity in BPD (67). At the same time, multiple studies support a diathesis-stress model of BPD, in which illness severity and progression are predicted by the interaction of genetics and stress (56, 68, 69). In this view, BPD emerges as a genetic condition with a psychiatric phenotype that is highly sensitive to environmental stress.

Several studies have documented the specific effects of psychosocial stress on symptom severity and recurrence in BPD (70, 71). Within the model of social rhythm disruption, studies show that stressful life events and a change in routine can predict higher frequency of mood episodes and delays in functional recovery (6, 71-74). There is also evidence that interpersonal stress, perception

of diminished social support, and failure to attain psychosocial goals are psychiatrically destabilizing for people with BPD (22, 74, 75). These studies highlight the importance of diminishing psychosocial stress in the interest of symptom prevention. Conventional pharmacological and psychotherapeutic treatments of BPD may be limited in their ability to decrease psychosocial stress. While psychiatric treatment facilitates changes within the individual, it carries little impact on the person's greater social environment. In many cases, an unsupportive psychosocial environment can substantially undermine the gains of treatment (23, 25, 34, 35, 76).

Synthesis

A synthesis of new findings across several research domains suggests that BPD develops from a genetic component that is highly sensitive to environmental stress (56, 68). In particular, psychosocial stress exacerbates the psychiatric syndrome, intensifies the ill effects of symptoms, and reduces quality of life (6, 70, 77). Repeated exposure to symptoms may then lead to neurodegeneration and cognitive decline over the course of the illness (55, 56). This process accounts for worsening psychosocial impairment in people with BPD that often persists in the absence of mood symptoms in the form of long-term disability (11, 12). As genetic factors remain largely unaffected by available interventions, preventive efforts need to focus on reducing psychosocial stress, particularly during early and vulnerable phases of the illness.

Current treatments that strive to reduce psychosocial stress, such as interpersonal and social rhythm therapy, attempt to improve functioning by engendering cognitive and behavioural changes within the individual (78, 79). While these therapies are effective in many cases, interventions aimed at altering the larger psychosocial environment of people with BPD might be as critical as internal treatments to their wellbeing, given that psychosocial disability is partly 'psyche' and partly 'social' in nature. Stated differently, the functional disability observed in people with BPD is not encapsulated within the individual, but rather is defined by the interaction between the individual's characteristics and the social environment (34, 35). Broader environmental changes conducive to stress reduction on a larger social scale – such as reduced public stigma and increased employment supports – may therefore substantially increase lifetime functional adjustment in BPD, as several studies have found (23, 25, 80).

Implications

The new research findings regarding the important role of psychosocial stress in the aetiology of BPD, and its associated functional impairment, may inform the development of policies that can bring about changes to social structures larger than individuals' immediate support networks. This process may begin with examining policies regarding disability support for BPD. The following discussion examines potential reforms to the current disability policies in the United States. Although disability policies vary across countries, the example of the U.S. Social Security Administration (SSA) may be useful in the present context for illustrating larger principles with global implications.
To provide a brief context for the discussion, the SSA provides cash benefits and public health insurance to people with disabilities in the United States through two programs: the Social Security Disability Insurance (SSDI) and the Supplemental Security Income (SSI) programs. SSDI, as its name reflects, was created to insure U.S. workers against disability. Thus, the SSDI program, in its original conception, aimed to provide long-term financial support to tax-paying U.S. workers over age fifty, who had developed severe physical impairments that precluded employment and from which they were not expected to recover (16). Current regulations governing SSDI eligibility are in large part unchanged since the program's inception, although the list of qualifying impairments has broadened greatly. Specifically, the list now includes psychiatric disorders such as BPD (81). Otherwise, the three primary eligibility criteria – evidence of having paid sufficient recent FICA taxes as SSDI "premiums," medical documentation of a qualifying impairment, and very limited earnings from employment for at least 12 continuous months (under $1,010 gross per month in 2012, totalling a limit of $12,120 gross per year) – remain the same (82).

The population of beneficiaries, however, has changed dramatically since the beginning of the

programme. People with psychological diagnoses are currently the biggest subset of SSDI and SSI benefit recipients, and their numbers are increasing (16). Unlike the more permanent and total disabilities acquired by older workers that were originally envisioned by SSDI policymakers, BPD, like many other psychiatric disorders, often presents early in life, and is typically long-lasting, fluctuating and highly treatable, with many people experiencing substantially improved functioning over time (16, 83). Prognoses for people with BPD are enhanced when interventions begin as close to initial symptom presentation as possible (84). In line with the history of the SSDI, however, to have BPD qualify as a disabling impairment, claimants are required to produce medical evidence of mood symptoms that have persisted over a significant period of time and either currently greatly limit their functioning, or did so at length in the past, such that even if presently asymptomatic, they are at high risk for future decompensation (85).

In this respect, SSA disability policy may be a poor fit with the needs of many individuals with BPD. People with BPD could likely benefit from financial, health insurance and employment supports early on in the course of their illness, with an eye towards relieving stress while preserving their functioning in mainstream settings to the greatest extent possible (16, 86-88). Further, the SSA requirement of evidence of prolonged mood disturbance ignores the detrimental effects that severe symptom exposure may have on the brain, cognition and prospective functional adjustment (59, 89, 90). Thus, the functioning of many people with BPD would probably be more greatly preserved if they were offered disability supports prior to experiencing prolonged psychiatric instability.

In addition, the SSA current disability policy does not consider that debilitating cognitive deficits can be present in BPD even in the absence of mood symptoms, and during early recovery from a severe episode of mood disturbance in particular (89, 90). The point of discharge from the first hospitalization is especially critical for intervention. For many people with BPD, the transition out of inpatient care may be accompanied by significant cognitive impairment in the context of residual mood symptoms. At this time, individuals with BPD are also vulnerable to the adverse effects of new medications, and the frightening confusion that follows the onset of a severe psychiatric disorder. Without proper support, they may be pressured into resuming functioning in a mainstream environment with demands that exceed their cognitive limitations and coping ability. This predicament is fraught with chronic stress that emanates from the constant threat of failure at work, school or other important social functions. The combination of a fragile emotional state, cognitive impairment, and chronic stress may exacerbate mood symptoms to the point of decompensation. Hospital readmission typically results in aggressive titration of sedative psychopharmacological medications (91), which may carry adverse effects that further impede recovery toward functional adjustment (56, 92). In this vicious cycle, inpatient treatment of BPD may unwittingly medicate the effects of psychosocial stress. An imbalanced reliance on pharmacological treatment may in fact add to functional challenges that could otherwise be diminished with policies that offer larger psychosocial supports.

The recognition that some people with BPD may not be able to compete for and successfully maintain employment right after leaving a first hospitalization may justify the provision of immediate financial and occupational support at discharge. Although many individuals with BPD eventually receive similar disability benefits in later stages of the illness, the long-needed support comes when their functioning is much more substantially curtailed – at a point in which their potential for psychosocial recovery has already been diminished by alterations in their developmental trajectory. In this regard, the early onset of BPD, most frequently calculated at an average of 25 years (93, 94), compounds the impact of this psychiatric illness on development. In fact, from a developmental perspective, in the absence of appropriate support, the passage of time alone may deepen functional impairments. For this reason, polices that emphasize early support may carry important preventive effects for BPD.

In addition, new studies in BPD can inform policy reform by pointing to gradations in functional adjustment. On one end of the spectrum are people fully dependent on external support due to unrelenting mood disturbance. On the other end, euthymic individuals face milder psychosocial challenges that emerge in mainstream professional, education and other settings. An effective disability policy needs to create conditions that allow for functional recovery in mainstream settings during the early stages of the illness instead of restricting the supportive effort to those who have

already reached a highly-dependent and socially-marginalized state (16, 88). The current policy of SSA leaves euthymic patients with mild to moderate cognitive dysfunctions at risk for further deterioration. Therefore, the chronicity of mood symptoms should not be the primary aspect of the illness that determines eligibility for support services, especially in younger age groups.

Supporting functional adjustment instead of disability

Under current SSA policies, a potential concern around providing early support for individuals with BPD - in an effort to help them resume or maintain mainstream functioning - might be that early support could incentivize reliance on disability benefits rather than on the exertion of compensated work. Indeed, most people who receive disability benefits for BPD do not return to full-time employment (95). However, this undesirable outcome may be partly due to a lack of program support for beneficiary employment, in keeping with the historical insurance mission of the SSDI program.

Many substantial disincentives to work embedded in SSA regulations have long been identified as impediments to beneficiaries (including specifically those with BPD) returning to mainstream functioning (16, 83). These disincentives include beneficiaries potentially losing the entirety of their cash benefits and putting their public health insurance eligibility at risk if they gross over $1,010 in any one month after a brief trial work period (82). Qualitative and quantitative research shows that, even when euthymic, beneficiaries with BPD view risking total loss of their benefits as overly risky, particularly given the occupational challenges and stigma they expect to face in the pursuit of new employment (83, 96). Fortunately, research aimed at replacing these barriers to work with employment incentives - including shifting to a more gradual reduction in benefits proportional to earned income – is ongoing and has found positive effects on participant beneficiaries' total income and other occupational outcomes (97, 98). Rapid implementation of these reforms is urgently needed, however, to improve occupational outcomes in BPD.

Furthermore, many people with BPD who experience milder forms of dysfunction may wish temporarily to rely on benefits at illness onset, without abandoning the natural pursuit of psychosocial growth. In other words, those who can continue to function in mainstream settings may not consider the financial benefits of disability as sufficient compensation for having to limit their income and employment, nor for having to experience the stigma, isolation, and other losses that come from adopting a formal status of disability (99). The pursuit of disability status by some individuals with BPD may therefore reflect their belief that fitting back into mainstream society is not currently possible for them. A shift in policies may help to change this view for many such people, especially during the earlier phases of their illness. Specifically, people with BPD may be more likely to pursue employment if they could rely on disability funds during periods of unemployment and recovery from debilitating mood episodes, without the need to endure recurrent, lengthy and complicated application processes.

A policy that supports full-time employment for people with BPD carries multi-faceted gains. From a purely financial perspective, the sheer monetary loss to the U.S. economy due to lost productivity of individuals with BPD and their caregivers was estimated at $38 billion in 1991 by the National Institutes of Health [NIH; 100]. Financial considerations aside, consistent employment represents one of the strongest predictors of psychiatric stability in people with BPD and plays an important role in their recovery process (101, 102). In this regard, early supported employment interventions have been found to correlate with improved future employment outcomes in adolescents and adults diagnosed with affective disorders (86-88). Thus, although a more severe course of illness clearly increases the probability of unemployment, a reverse direction of causality might also be true: unemployment can exacerbate illness severity (102-105). In some respects, there is no reason to assume that the effects of unemployment on those who are diagnosed with BPD and people without a psychiatric illness are widely different. In both cases, extended periods of unemployment, especially in young adulthood, are exceptionally detrimental to mental health and functional adjustment across multiple psychosocial domains (104-106). In the case of BPD, however, the stress, stigma and loss of income associated with unemployment can inflame symptoms and lead to decompensation.

Effective changes in disability policies may be further informed by studies that examined factors related to successful employment in BPD. A large-sample study from New Zealand found that, beyond clinical factors, the goodness-of-fit between the individual, their job and the level of social support they experienced at work played an important role in long-term employment outcomes (107, 108). An increasing number of studies have substantiated key elements of a supported employment (SE) model – known as Individual Placement and Support (IPS) - that has been found to result in better clinical outcomes, as well as improved global, social and occupational functioning for people with psychiatric disorders including BPD (109-111). Key evidence-based components of the IPS model of SE include open enrolment for all people with psychiatric disorders who are interested in working; an aim to obtain competitive employment for them, as opposed to volunteer or "stepping-stone" work; the integration of clinical and vocational services; the provision of counselling around working while receiving government benefits; the prioritization of clients' employment preferences; rapid job placement; and the provision of long-term "follow-along" on-the-job support (109, 112). This last element, long-term on-the-job support from SE program case-workers (known as "employment specialists") may be particularly helpful in empowering people with BPD to cope successfully with occupational challenges, including with cognitive impairment at work and with negotiations with their employers around the accommodations necessary to maximize their productivity (109). Indeed, recent studies have found that the more frequent the contact between these "employment specialists" and employees with psychiatric disorders such as BPD, the longer the employment lasts (112, 113). In addition, several studies have found that adding the option of supported education services, along with cognitive remediation and social skills training to SE programs, further improves outcomes for people with psychiatric disabilities (114-116). Finally, programs through which people with psychiatric disorders can obtain the support of peers facing similar challenges are showing effects in improving social and occupational outcomes (117). SE programs may also carry especially powerful impacts for young adults with BPD (86, 87). In summary, a growing number of studies have highlighted the effectiveness of long-term coordination between clinical services, vocational and peer support services, and employers in enhancing work performance and retention for people with BPD (109, 118, 119).

Supported employment programs currently exist and are offered in some cases to disability beneficiaries, yet access to them is limited and their quality varies widely (16, 120). Despite research bolstering the effectiveness of specific elements of SE programs, many such services are not fully evidence-based and are often not a central piece of disability support. A commitment by the SSA and other government agencies to focusing on supporting adjustment and person-cantered recovery rather than disability in BPD may require a greater diversion of resources to develop, implement, monitor and evaluate widespread evidence-based SE programs. Increased competitive employment is likely to improve a wide range of outcomes for, and decrease public stigma and discrimination against, individuals who are negotiating BPD (121, 122).

Removing social barriers to employment

In BPD, mood disturbance may be one in an array of impediments to full-time employment (35). Therefore, a policy that works to remove additional barriers to employment may result in gains both to individuals with BPD and society at large. One of the most challenging barriers to overcome involves discrimination against people with BPD in the hiring of them into employment and, even more pronounced, in their retention (123, 124). This discrimination is probably based in part on the belief that hiring or retaining people with BPD is not cost effective (125-127). Employers have specifically emphasized concerns regarding inconsistent attendance, inability to cope with stress, poor performance, disruptive reactions of co-workers and the negative effects of emotional instability on the work environment (125, 128). This view is consistent with data indicating that people with BPD exhibit substantially higher degrees of workplace absenteeism, presenteeism and other occupational impairment compared to the general population (125, 129, 130). According to some estimates, people with BPD miss an average of up to 65.5 workdays a year when time lost due to illness-related absenteeism and presenteeism is combined (131). Thus, based on data and possibly their own experience, employers may feel that they have legitimate concerns regarding the employment of people with BPD (125). Disability and supported employment programs must therefore work with

employers to offset the cost of the potential accommodations for people with BPD, including those required by law under the Americans with Disabilities Act (99, 132).

While federal and most state governments already offer employer tax incentives and deductions for hiring people with disabilities, employers still currently bear the brunt of the cost of disability accommodations (132). More extensive governmental support of employers, such as through education, advising and additional funding is probably needed to increase hiring and retention rates in BPD. In addition, discussions between disabled employees and employers regarding which accommodations would most improve their functioning and productivity are currently optional and left largely to the initiative of the disabled employee (132). Disabled employees may fear stigma and discrimination, were they to begin such a discussion, however, and the need to do so may peak at a time when these employees are under high levels of stress. Once employees have identified themselves as disabled to their employer, employer-employee interaction around accommodation should be legally required and facilitated by governmental disability support programs (132). Thus, aside from providing financial support, programs may inform employers about effective accommodations that have been shown to reduce occupational impairments and improve productivity in BPD, and thus may result in savings that outweigh their cost.

Discrimination against employing people with BPD is also due in part to stigmatization (17, 99, 123, 133). Multiple recent studies in different countries documented intense public stigma against people with mood disorders, reflecting serious doubts about their ability to hold responsible jobs (127, 133, 134). Several authors have maintained that stigma may be a stronger barrier to employment than any limitations imposed by the psychiatric illness itself (17, 18, 135-137). Indeed, despite substantial therapeutic advances, levels of public stigmatization, social and occupational functional impairment, including unemployment and underemployment, of people with BPD have all significantly increased since the 1990s (14, 138), the 1970s (15) and even since the 1950s (139). People with psychiatric diagnoses such as BPD are, in fact, substantially more likely to experience discrimination in employment than people with other disabilities (140), despite that the average education level in BPD is higher than that of the general population (141). For instance, a study that controlled for gender, functional limitations and non-wage incomes still found a 21% unexplained difference in employment rates between people with mood disorders and people without psychiatric diagnoses (134). Notably, however, employers' prior experience with employees with psychiatric difficulties increased their willingness to hire people who face similar challenges (142). Thus, substantial evidence indicates that high unemployment rates in BPD are not due entirely to functional impairment but also to the simple fact that employers refuse to hire or retain people with this diagnosis (125, 127, 133, 134).
While discrimination directly prevents employment opportunities, perceived stigma leads to work impairment and avoidance because of the stress associated with the inhospitable environment it creates. This notion emerges from studies showing that people with BPD experience high interpersonal stress at work surrounding their psychiatric illness (19, 101, 143). Surveys demonstrate that almost 90% of respondents diagnosed with BPD reported difficulty getting along with employers due to illness-related issues (143, 144). In both qualitative and quantitative studies, most respondents attribute employment difficulties in large part to stigma and discrimination, and highlight intense feelings of embarrassment and shame in the workplace (14, 19, 145). Further frustration comes from being offered poorly paid, entry-level or unskilled placements that are not commensurate with education level, professional skill, and the desire for pursuing meaningful work (137). These difficulties can lead to occupational avoidance that is related to expectations of rejection and social stress more than professional incompetence (19, 124, 143).
Low employment rates in BPD may therefore emanate from factors beyond those directly related to mood disturbance, including rejection by employers and avoidance of stressful environments that may contribute to psychiatric instability. In the current social climate, psychiatric treatment struggles to gain momentum, as it faces the challenge of caring for severe mental illness that is compounded by the devastating effects of extreme social marginalization. Discrimination has no pharmacological remedy. It can only be addressed by shifts in social climate and government policies. These may hold the promise of reducing stigma and discrimination, and consequently decreasing psychosocial stress, the severity of symptoms, excessive use of psychotropic medications, reliance on disability funds, and medical expenses.

Conclusions

New research in BPD reveals that poor functional adjustment persists beyond the resolution of mood symptoms. Studies indicate reductions in brain volume and cognitive decline over the course of the illness, especially in individuals with a more severe psychiatric syndrome. These findings advanced the neurodegenerative hypothesis in BPD, which highlights the detrimental effects of mood symptoms on the brain and cognition, and the consequent impairment in functional adjustment. The neurodegenerative account emphasizes the importance of preventive care, and the need to identify factors that exacerbate illness severity in BPD. Studies in this area indicate that the inflammation of mood symptoms in BPD is rooted in the interaction between genetic risk and psychosocial stress. As genetic factors are not subject to therapeutic change, preventive efforts should focus on the reduction of psychosocial stress.

These conclusions carry implications for public policies concerning disability benefits. In the case of BPD, current eligibility criteria emphasize the presence of chronic affective symptoms and the absence of significant employment. As a result, support is restricted to covering the basic needs of individuals who are debilitated by severe mood disturbance. Furthermore, efforts by disability benefit beneficiaries to return to full-time employment is discouraged by limited access to effective SE programs and the lack of a sufficient transition period in which beneficiaries can work and retain benefits. Providing supports during earlier stages of the illness may allow people with BPD to retain mainstream employment and other social roles at higher rates, in a manner that alters the course of their illness. Beyond financial supports that incentivize work over unemployed disability, policies need to create structures that actively reduce psychosocial stress for people with BPD. Supportive services need to address tensions between cognitive impairments and functional demands that arise at work. In addition, they need to accommodate and guide employers who hire people with BPD. This may be accomplished through various forms of external measures, including agents who actively seek to monitor and improve the goodness of fit between employees with BPD and their work environment. In this respect, taking case-specific steps to reduce stigma and discrimination against BPD in the workplace may be central to the effort of keeping people with BPD effectively employed in the long term.
In summary, new research may guide the development of effective disability policies for BPD. Specifically, informed policies may create supportive work environments and opportunities for employment commensurate with education level and professional competency. The combination of meaningful work, effective accommodations for illness-specific limitations, and social support, may bring significant improvement to the quality of life and mental stability of people with BPD. In many respects, it may reduce the stress that aggravates the illness and creates excessive reliance on psychiatric care. More broadly, research-informed polices may even hold the promise of shifting the psychosocial trajectory of BPD from disability to growth.

GP Comment

What have I learned from this paper?

This article considers how the neurodegenerative model highlights the importance of effective preventative care in order to preserve functional adjustment for those with bipolar disorder through reduction of psychosocial stress in addition to therapy and medication. The authors go on to discuss the important implications of this for disability policy.

For the front-line clinician and the commissioner there are clear messages with regard to considering support into beneficial employment, developing the understanding of employers, reducing psychosocial stresses in the work environment, reducing the significant employment stigma faced by those with bipolar disorder and reducing the psychosocial stresses in the individual's wider social environment.

The need to create conditions that allow functional recovery in mainstream settings for GPs means that medical reports need to reflect the challenges and the benefits of the work environment. Fit

notes need to be used effectively to communicate ways in which psychosocial stress can be reduced for the individual in a particular work environment. This paper contains a great deal of useful information to support these processes and highlights the need for long-term close liaison between clinical services, vocational and peer support services and employers. There is also useful information regarding heritability of disease and disease severity, questions often brought to the GP by family members.

Discussion of the importance of therapy, medication AND interventions which reduce stress in the wider social environment - all as close to initial symptom presentation as possible and the critical period of discharge from first hospitalization - are valuable for both the front-line clinician and commissioner.

Dr Jane Leigh, GP.

References

1. Reiser R, Reddy S, Parkins MM, Thompson LW, Gallagher-Thompson D. Bipolar disorder is ranked among the top 10 disabling illnesses in the world. Cognitive Behavior Therapy with Older Adults: Innovations Across Care Settings 2011:65.
2. Mur M, Portella M, Martinez-Aran A, Pifarre J, Vieta E. Long-term stability of cognitive impairment in bipolar disorder: a 2-year follow-up study of lithium-treated euthymic bipolar patients. J Clin Psychiatry 2008;69 (5):712-9.
3. Martínez-Arán A, Torrent C, Solé B, Bonnín CM, Rosa AR, Sánchez-Moreno J, et al. Functional remediation for bipolar disorder. Clin Pract Epidemiol Ment Health 2011;7:112.
4. Rosa AR, Bonnin CM, Vazquez GH, Reinares M, Sole B, Tabares-Seisdedos R, et al. Functional impairment in bipolar II disorder: is it as disabling as bipolar I? J Affect Disord 2010;127 (1-3):71-6.
5. Tohen M, Hennen J, Zarate Jr CM, Baldessarini RJ, Strakowski SM, Stoll AL, et al. Two-year syndromal and functional recovery in 219 cases of first-episode major affective disorder with psychotic features. Am J Psychiatry 2000;157 (2):220.
6. Yan-Meier L, Eberhart NK, Hammen CL, Gitlin M, Sokolski K, Altshuler L. Stressful life events predict delayed functional recovery following treatment for mania in bipolar disorder. Psychiatry Res 2011;186 (2-3):267-71.
7. Michalak E. Burden of bipolar depression: Impact of disorder and medications on quality of life. CNS Drugs 2008;22 (5):389-406.
8. Michalak EE, Yatham LN, Lam RW. Quality of life in bipolar disorder: a review of the literature. Health Qual Life Outcomes 2005;3:72.
9. Gildengers AG, Butters MA, Chisholm D, Rogers JC, Holm MB, Bhalla RK, et al. Cognitive functioning and instrumental activities of daily living in late-life bipolar disorder. Am J of Geriatric Psych 2007;15 (2):174.
10. Shapira B, Zislin J, Gelfin Y, Osher Y. Social adjustment and self-esteem in remitted patients with unipolar and bipolar affective disorder: A case-control study* 1. Compr Psychiatry 1999;40 (1): 24-30.
11. Rosa AR, Reinares M, Michalak EE, Bonnin C, Sole B, Franco C, et al. Functional impairment and disability across mood states in bipolar disorder. Value in Health 2010;13 (8):984-8.
12. Sanchez-Moreno J, Martinez-Aran A, Tabarés-Seisdedos R, Torrent C, Vieta E, Ayuso-Mateos J. Functioning and disability in bipolar disorder: an extensive review. Psychother Psychosom 2009;78 (5):285-97.
13. Bearden CE, Shih VH, Green MF, Gitlin M, Sokolski KN, Levander E, et al. The impact of neurocognitive impairment on occupational recovery of clinically stable patients with bipolar disorder: a prospective study. Bipolar Disord 2011;13 (4):323-33.
14. Hirschfeld R, Lewis L, Vornik LA. Perceptions and impact of bipolar disorder: How far have we really come? Results of the National Depressive and Manic-Depressive Association 2000 survey of individuals with bipolar disorder. J Clin Psychiatry 2003;64 (2):161-74.
15. Huxley N, Baldessarini RJ. Disability and its treatment in bipolar disorder patients. Bipolar Disord 2007;9:183-96.
16. Drake RE, Skinner JS, Bond GR, Goldman HH. Social security and mental illness: reducing disability

with supported employment. Health Aff (Millwood) 2009;28 (3):761-70.
17. Waghorn G, Lloyd C. Employment and people with mental Illness. Vocational Rehabilitation and Mental Health 2010:1-18.
18. Michalak EE, Yatham LN, Kolesar S, Lam RW. Bipolar disorder and quality of life: a patient-centered perspective. Qual Life Res 2006;15 (1):25-37.
19. Michalak E, Livingston JD, Hole R, Suto M, Hale S, Haddock C. 'It's something that I manage but it is not who I am': reflections on internalized stigma in individuals with bipolar disorder. Chronic Illn 2011.
20. Simon GE, Bauer MS, Ludman EJ, Operskalski BH, Unützer J. Mood symptoms, functional impairment, and disability in people with bipolar disorder: specific effects of mania and depression. J Clin Psychiatry 2007;68 (8):1237.
21. MacQueen GM, Young LT, Joffe RT. A review of psychosocial outcome in patients with bipolar disorder. Acta Psychiatr Scand 2001;103 (3):163-70.
22. Sanchez-Moreno J, Martinez-Aran A, Gadelrab HF, Cabello M, Torrent C, Bonnin Cdel M, et al. The role and impact of contextual factors on functioning in patients with bipolar disorder. Disabil Rehabil 2010;32 Suppl 1:S94-S104.
23. Vazquez GH, Kapczinski F, Magalhaes PV, Cordoba R, Lopez Jaramillo C, Rosa AR, et al. Stigma and functioning in patients with bipolar disorder. J Affect Disord 2011;130 (1-2):323-7.
24. Altshuler L, Post RM, Black DO, Keck PE, Nolen WA, Frye MA, et al. Subsyndromal depressive symptoms are associated with functional impairment in patients with bipolar disorder: results of a large, multisite study. J Clin Psychiatry 2006;67 (10):1551-60.
25. Cerit C, Filizer A, Tural Ü, Tufan AE. Stigma: a core factor on predicting functionality in bipolar disorder. Compr Psychiatry 2011.
26. Depp CA, Mausbach BT, Harmell AL, Savla GN, Bowie CR, Harvey PD, et al. Meta?analysis of the association between cognitive abilities and everyday functioning in bipolar disorder. Bipolar Disord 2012;14 (3):217-26.
27. Martinez-Aran A, Vieta E, Torrent C, Sanchez-Moreno J, Goikolea J, Salamero M, et al. Functional outcome in bipolar disorder: the role of clinical and cognitive factors. Bipolar Disord 2007;9 (1-2):103-13.
28. Martinez-Aran A, Vieta E, Reinares M, Colom F, Torrent C, Sanchez-Moreno J, et al. Cognitive function across manic or hypomanic, depressed, and euthymic states in bipolar disorder. Am J Psychiatry 2004;161 (2):262.
29. Ancin I, Santos JL, Teijeira C, Sanchez-Morla EM, Bescos MJ, Argudo I, et al. Sustained attention as a potential endophenotype for bipolar disorder. Acta Psychiatr Scand 2010;122 (3):235-45.
30. Bonnin CM, Martinez-Aran A, Torrent C, Pacchiarotti I, Rosa AR, Franco C, et al. Clinical and neurocognitive predictors of functional outcome in bipolar euthymic patients: a long-term, follow-up study. J Affect Disord 2010;121 (1-2):156-60.
31. Mur M, Portella MJ, Mártinez-Arán A, Pifarré J, Vieta E. Persistent neuropsychological deficit in euthymic bipolar patients: executive function as a core deficit. J Clin Psychiatry 2007;68 (7): 1078-86.
32. Bonnín C, Sánchez-Moreno J, Martínez-Arán A, Solé B, Reinares M, Rosa A, et al. Subthreshold symptoms in bipolar disorder: Impact on neurocognition, quality of life and disability. J Affect Disord 2011;136 (2012):650-59.
33. Depp CA, Mausbach BT, Bowie C, Wolyniec P, Thornquist MH, Luke JR, et al. Determinants of occupational and residential functioning in bipolar disorder. J Affect Disord 2011.
34. Levy B, Manove E. Functional outcome in bipolar disorder: the big picture. Depr Res Treatment 2012;2012.
35. Manove E, Price LM, Levy B. Psychosocial functioning in bipolar disorder from a social justice perspective. In: Barnhill J, editor. Bipolar Disorder. Rijeka, Croatia: InTech; 2012.
36. O'Shea R, Poz R, Michael A, Berrios GE, Evans JJ, Rubinsztein JS. Ecologically valid cognitive tests and everyday functioning in euthymic bipolar disorder patients. J Affect Disord 2010;125 (1-3): 336-40.
37. Depp CA, Cain AE, Palmer BW, Moore DJ, Eyler LT, Lebowitz BD, et al. Assessment of medication management ability in middle-aged and older adults with bipolar disorder. J Clin Psychopharmacol 2008;28 (2):225-9.
38. Martinez-Aran A, Scott J, Colom F, Torrent C, Tabares-Seisdedos R, Daban C, et al. Treatment

nonadherence and neurocognitive impairment in bipolar disorder. J Clin Psychiatry 2009; 70 (7):1017-23.
39. Burdick KE, Goldberg JF, Harrow M. Neurocognitive dysfunction and psychosocial outcome in patients with bipolar I disorder at 15-year follow-up. Acta Psychiatr Scand 2010;122 (6):499-506.
40. Haro JM, Reed C, Gonzalez-Pinto A, Novick D, Bertsch J, Vieta E. 2-Year course of bipolar disorder type I patients in outpatient care: factors associated with remission and functional recovery. Eur Neuropsychopharmacol 2011;21 (4):287-93.
41. Montoya A, Tohen M, Vieta E, Casillas M, Chacon F, Polavieja P, et al. Functioning and symptomatic outcomes in patients with bipolar I disorder in syndromal remission: a 1-year, prospective, observational cohort study. J Affect Disord 2010;127 (1-3):50-7.
42. Weinstock LM, Miller IW. Psychosocial predictors of mood symptoms 1 year after acute phase treatment of bipolar I disorder. Compr Psychiatry 2010;51 (5):497-503.
43. Chen CH, Suckling J, Lennox BR, Ooi C, Bullmore ET. A quantitative meta?analysis of fMRI studies in bipolar disorder. Bipolar Disord 2011;13 (1):1-15.
44. Selvaraj S, Arnone D, Job D, Stanfield A, Farrow TFD, Nugent AC, et al. Grey matter differences in bipolar disorder: a meta?analysis of voxel?based morphometry studies. Bipolar Disord 2012;14 (2):135-45.
45. Arnone D, Cavanagh J, Gerber D, Lawrie SM, Ebmeier KP, McIntosh AM. Magnetic resonance imaging studies in bipolar disorder and schizophrenia: meta-analysis. Br J Psychiatry 2009;195 (3):194-201.
46. Fusar-Poli P, Howes O, Bechdolf A, Borgwardt S. Mapping vulnerability to bipolar disorder: a systematic review and meta-analysis of neuroimaging studies. J Psychiatry Neurosci 2012;37 (3):170-84.
47. Kurnianingsih YA, Kuswanto CN, McIntyre RS, Qiu A, Ho BC, Sim K. Neurocognitive-genetic and neuroimaging-genetic research paradigms in schizophrenia and bipolar disorder. J Neural Transm 2011:1-19.
48. Zuliani R, Moorhead TWJ, Job D, McKirdy J, Sussmann JED, Johnstone EC, et al. Genetic variation in the G72 (DAOA) gene affects temporal lobe and amygdala structure in subjects affected by bipolar disorder. Bipolar Disord 2009;11 (6):621-7.
49. Vita A, De Peri L, Sacchetti E. Gray matter, white matter, brain, and intracranial volumes in first?episode bipolar disorder: a meta?analysis of magnetic resonance imaging studies. Bipolar Disord 2009;11 (8):807-14.
50. De Peri L, Crescini A, Deste G, Fusar-Poli P, Sacchetti E, Vita A. Brain structural abnormalities at the onset of schizophrenia and bipolar disorder: A meta-analysis of controlled magnetic resonance imaging studies. Curr Pharm Design 2012;18 (4):486-94.
51. Ellison-Wright I, Bullmore E. Anatomy of bipolar disorder and schizophrenia: a meta-analysis. Schizophr Res 2010;117 (1):1-12.
52. Beyer JL, Young R, Kuchibhatla M, Krishnan KRR. Hyperintense MRI lesions in bipolar disorder: A meta-analysis and review. Intl Rev Psychiatry 2009;21 (4):394-409.
53. Lewandowski K, Cohen B, Öngur D. Evolution of neuropsychological dysfunction during the course of schizophrenia and bipolar disorder. Psychol Med 2011;41 (2):225.
54. Seidman L, Cherkerzian S, Goldstein J, Agnew-Blais J, Tsuang M, Buka S. Neuropsychological performance and family history in children at age 7 who develop adult schizophrenia or bipolar psychosis in the New England Family Studies. Psychol Med 2012;1 (1):1-13.
55. Goodwin GM, Martinez-Aran A, Glahn DC, Vieta E. Cognitive impairment in bipolar disorder: neurodevelopment or neurodegeneration? An ECNP expert meeting report. Eur Neuropsychopharmacol 2008;18 (11):787-93.
56. Vieta E, Popovic D, Rosa A, Solé B, Grande I, Frey B, et al. The clinical implications of cognitive impairment and allostatic load in bipolar disorder. Eur Psychiatry 2012.
57. Townsend J, Bookheimer SY, Foland-Ross LC, Sugar CA, Altshuler LL. fMRI abnormalities in dorsolateral prefrontal cortex during a working memory task in manic, euthymic and depressed bipolar subjects. Psych Res: Neuroimaging 2010;182 (1):22-9.
58. Kurnianingsih YA, Kuswanto CN, McIntyre RS, Qiu A, Ho BC, Sim K. Neurocognitive-genetic and neuroimaging-genetic research paradigms in schizophrenia and bipolar disorder. J Neural Transm 2011;118 (11):1621-39.
59. Moorhead TWJ, McKirdy J, Sussmann JED, Hall J, Lawrie SM, Johnstone EC, et al. Progressive gray matter loss in patients with bipolar disorder. Biol Psychiatry 2007;62 (8):894-900.

60. MacQueen GM, Young LT, Robb JC, Marriott M, Cooke RG, Joffe RT. Effect of number of episodes on wellbeing and functioning of patients with bipolar disorder. Acta Psychiatr Scand 2000;101 (5): 374-81.
61. Kupferschmidt DA, Zakzanis KK. Toward a functional neuroanatomical signature of bipolar disorder: Quantitative evidence from the neuroimaging literature. Psychiatry Res: Neuroimaging 2011;193 (2):71-9.
62. Alaerts M, Del?Favero J. Searching genetic risk factors for schizophrenia and bipolar disorder: learn from the past and back to the future. Human Mutation 2009;30 (8):1139-52.
63. Choi KH, Higgs BW, Wendland JR, Song J, McMahon FJ, Webster MJ. Gene expression and genetic variation data implicate PCLO in Bipolar Disorder. Biol Psychiatry 2011;69 (4):353-9.
64. Barnett J, Smoller J. The genetics of bipolar disorder. Neuroscience 2009;164 (1):331-43.
65. Chen D, Jiang X, Akula N, Shugart Y, Wendland J, Steele C, et al. Genome-wide association study meta-analysis of European and Asian-ancestry samples identifies three novel loci associated with bipolar disorder. Mol Psychiatry 2011.
66. McGuffin P, Rijsdijk F, Andrew M, Sham P, Katz R, Cardno A. The heritability of bipolar affective disorder and the genetic relationship to unipolar depression. Arch Gen Psychiatry 2003;60 (5):497.
67. Dizier MH, Etain B, Lajnef M, Lathrop M, Grozeva D, Craddock N, et al. Genetic heterogeneity according to age at onset in bipolar disorder: A combined positional cloning and candidate gene approach. Am J Med Genetics Part B: Neuropsychiatric Genetics 2012.
68. Brietzke E, Mansur RB, Soczynska J, Powell AM, McIntyre RS. A theoretical framework informing research about the role of stress in the pathophysiology of bipolar disorder. Prog Neuropsychopharmacol Biol Psychiatry 2012.
69. Hosang GM, Uher R, Keers R, Cohen-Woods S, Craig I, Korszun A, et al. Stressful life events and the brain-derived neurotrophic factor gene in bipolar disorder. J Affect Disord 2010;125 (1-3):345-9.
70. Cohen AN, Hammen C, Henry RM, Daley SE. Effects of stress and social support on recurrence in bipolar disorder. J Affect Disord 2004;82 (1):143-7.
71. Hlastala SA, Varley JA. Stress, social rhythms, and behavioral activation: psychosocial factors and the bipolar illness course. Curr Psychosis Ther Rep 2004;2 (4):160-6.
72. Malkoff-Schwartz S, Frank E, Anderson B, Hlastala S, Luther J, Sherrill J, et al. Social rhythm disruption and stressful life events in the onset of bipolar and unipolar episodes. Psychol Med 2000;30 (05):1005-16.
73. Shen GHC, Alloy LB, Abramson LY, Sylvia LG. Social rhythm regularity and the onset of affective episodes in bipolar spectrum individuals. Bipolar Disord 2008;10 (4):520-9.
74. Johnson L, Lundström O, Åberg Wistedt A, Mathé AA. Social support in bipolar disorder: its relevance to remission and relapse. Bipolar Disord 2003;5 (2):129-37.
75. Johnson SL, Winnett, C.A., Meyer, B., Greenhouse, W.J., Miller, I. Social support and the course of bipolar disorder. J Abnorm Psychol 1999;108 (4):558-66.
76. Loch AA. Stigma and higher rates of psychiatric re-hospitalization: São Paulo public mental health system. Rev Brasil Psiquiatria 2012;34 (2):185-92.
77. Dienes KA, Hammen C, Henry RM, Cohen AN, Daley SE. The stress sensitization hypothesis: understanding the course of bipolar disorder. J Affect Disord 2006;95 (1-3):43-9.
78. Frank E, Soreca I, Swartz H, Fagiolini A, Mallinger A, Thase M, et al. The role of interpersonal and social rhythm therapy in improving occupational functioning in patients with bipolar I disorder. Am J Psychiatry 2008;165 (12):1559-65.
79. Swartz HA, Frank E, Zajac LE, Kupfer DJ. Interpersonal and social rhythm therapy for bipolar disorder. Bipolar Disord 2010:430-42.
80. Thomé E, Dargél A, Migliavacca F, Potter W, JAPPUR D, Kapczinski F, et al. Stigma experiences in bipolar patients: the impact upon functioning. J Psychiatr Ment Health Nurs 2011.
81. U.S. Social Security Administration. http://www.ssa.gov/disability/professionals/bluebook/12.00-MentalDisorders-Adult.htm. Accessed 07/07/2012.
82. U.S. Social Security Administration. http://www.ssa.gov/pgm/disability.htm. Accessed 07/07/2012.
83. Elinson L, Houck P, Pincus HA. Working, receiving disability benefits, and access to mental health care in individuals with bipolar disorder. Bipolar Disord 2007;9 (1 2):158-65.
84. Treuer T, Tohen M. Predicting the course and outcome of bipolar disorder: a review. Eur Psychiatry 2010;25 (6):328-33.
85. U.S. Social Security Administration. http://www.ssa.gov/disability/professionals/bluebook/12.00-

MentalDisorders-Adult.htm. Accessed 07/07/2012.
86. Browne DJ, Waghorn G. Employment services as an early intervention for young people with mental illness. Early Interv Psychiatry 2010;4 (4):327-35.
87. Burke-Miller J, Razzano LA, Grey DD, Blyler CR, Cook JA. Supported employment outcomes for transition age youth and young adults. Psychiatr Rehabil J 2012;35 (3):171-9.
88. Major BS, Hinton MF, Flint A, Chalmers-Brown A, McLoughlin K, Johnson S. Evidence of the effectiveness of a specialist vocational intervention following first episode psychosis: a naturalistic prospective cohort study. Soc Psychiatry Psychiatr Epidemiol 2010;45 (1):1-8.
89. Levy B, Manove E, Weiss R. Recovery of cognitive functioning in patients with co-occurring bipolar disorder and alcohol dependence during early remission from an acute mood episode. Ann Clin Psychiatry 2012;24 (2):143.
90. Levy B, Monzani BA, Stephansky MR, Weiss RD. Neurocognitive impairment in patients with co-occurring bipolar disorder and alcohol dependence upon discharge from inpatient care. Psychiatry Res 2008;161 (1):28-35.
91. Centorrino F, Ventriglio A, Vincenti A, Talamo A, Baldessarini RJ. Changes in medication practices for hospitalized psychiatric patients: 2009 versus 2004. Hum Psychopharmacol: Clin & Experimental 2010;25 (2):179-86.
92. Goldberg JF, Roy Chengappa K. Identifying and treating cognitive impairment in bipolar disorder. Bipolar Disord 2009;11:123-37.
93. Larsson S, Lorentzen S, Mork E, Barrett EA, Steen NE, Lagerberg TV, et al. Age at onset of bipolar disorder in a Norwegian catchment area sample. J Affect Disord 2010;124 (1-2):174-7.
94. Manchia M, Lampus S, Chillotti C, Sardu C, Ardau R, Severino G, et al. Age at onset in Sardinian bipolar I patients: evidence for three subgroups. Bipolar Disord 2008;10 (3):443-6.
95. Liu S, Stapleton D. How many SSDI beneficiaries leave the rolls for work? More than you might think. Washington, DC: Center for Studying Disability Policy. Mathematica Research; 2010. p. 1-4.
96. Larson JE, Barr LK, Corrigan PW, Kuwabara SA, Boyle MG, Glenn TL. Perspectives on benefits and costs of work from individuals with psychiatric disabilities. J Voc Rehabilitation 2007;26 (2):71-7.
97. Chambless CE, Julnes G, McCormick ST, Reither A. Supporting work effort of SSDI beneficiaries: Implementation of benefit offset pilot demonstration. J Disab Policy Studies 2011;22 (3):179-88.
98. Roche JS, Bonnie O'Day A, Schimmel J, O'Day B, Roche A. The Work Incentives Planning and Assistance Program: Promoting employment among Social Security disability beneficiaries. Washington, DC: Center for Studying Disability Policy. Mathematica Policy Research; 2012.
99. Selmi M. The stigma of disabilities and the Americans with Disabilities Act. Disab Aging Discrim 2011:123-43.
100. Wyatt R, Henter I. An economic evaluation of manic-depressive illness-1991. Soc Psychiatry Psychiatr Epidemiol 1995;30 (5):213-9.
101. Borg M, Veseth M, Binder PE, Topor A. The role of work in recovery from bipolar disorders. Qual Soc Work 2011.
102. Dunn EC, Wewiorski NJ, Rogers ES. The meaning and importance of employment to people in recovery from serious mental illness: results of a qualitative study. Psychiatr Rehabil J 2008;32 (1):59-62.
103. Mota-Pereira J. P-507-Unemployment and income lowering increase risk of depression relapse. Eur Psychiatry 2012;27:1.
104. Paul KI, Moser K. Unemployment impairs mental health: Meta-analyses. J Voc Behav 2009;74 (3):264-82.
105. Mossakowski KN. The influence of past unemployment duration on symptoms of depression among young women and men in the United States. Am J Public Health 2009;99 (10):1826-32.
106. Backhans MC, Hemmingsson T. Unemployment and mental health-who is (not) affected? Eur J Public Health 2011.
107. Tse S. Practice guidelines: Therapeutic interventions aimed at assisting people with bipolar affective disorder achieve their vocational goals. Work 2002;19 (2):167-79.
108. Tse S, Yeats M. What helps people with bipolar affective disorder succeed in employment: A grounded theory approach. Work 2002;19 (1):47-62.
109. Mueser KT, Bond GR. Supported Employment. Handbook of Community Psychiatry 2012:309-18.
110. Heslin M, Howard L, Leese M, McCRONE P, Rice C, Jarrett M, et al. Randomized controlled trial of supported employment in England: 2 year follow-up of the Supported Work and Needs (SWAN)

study. World Psychiatry 2011;10 (2):132.
111. Burns T, Catty J, White S, Becker T, Koletsi M, Fioritti A, et al. The impact of supported employment and working on clinical and social functioning: results of an international study of individual placement and support. Schizophr Bull 2009;35 (5):949-58.
112. Bond GR, Kukla M. Impact of follow-along support on job tenure in the individual placement and support model. J Nerv Ment Dis 2011;199 (3):150-5.
113. Roy L, Rousseau J, Fortier P, Mottard JP. Transitions to adulthood in first-episode psychosis: a comparative study. Early Interv Psychiatry 2012.
114. Tsang HW, Chan A, Wong A, Liberman RP. Vocational outcomes of an integrated supported employment program for individuals with persistent and severe mental illness. J Behav Ther Exp Psychiatry 2009;40 (2):292-305.
115. Nuechterlein KH, Subotnik KL, Turner LR, Ventura J, Becker DR, Drake RE. Individual placement and support for individuals with recent-onset schizophrenia: integrating supported education and supported employment. Psychiatr Rehabil J 2008;31 (4):340-9.
116. Bond GR, Drake RE, Becker DR. An update on randomized controlled trials of evidence-based supported employment. Psychiatr Rehabil J 2008;31 (4):280-90.
117. Daniels AS, Bergeson S, Fricks L, Ashenden P, Powell I. Pillars of peer support: advancing the role of peer support specialists in promoting recovery. J Ment Health Training, Educ & Practice 2012;7 (2):60-9.
118. Kukla M, Bond GR. The working alliance and employment outcomes for people with severe mental illness enrolled in vocational programs. Rehabil Psychol 2009;54 (2):157-63.
119. Waghorn G, Childs S, Hampton E, Gladman B, Greaves A, Bowman D. Enhancing community mental health services through formal partnerships with supported employment providers. Am J Psych Rehabilitation 2012;15 (2):157-80.
120. Menear M, Reinharz D, Corbiere M, Houle N, Lanctot N, Goering P, et al. Organizational analysis of Canadian supported employment programs for people with psychiatric disabilities. Soc Sci Med 2011;72 (7):1028-35; discussion 36-8.
121. Perkins DV, Raines JA, Tschopp MK, Warner TC. Gainful employment reduces stigma toward people recovering from schizophrenia. Community Ment Health J 2009;45 (3):158-62.
122. Tsang HWH, Fong MWM, Fung KMT, Corrigan PW. Reducing employers' stigma by supported employment. Vocational Rehabilitation and Mental Health 2010:51-64.
123. Bonnington O, Rose D, Callard F. Social inclusion, stigma and discrimination relating to employment and physical health: the experiences of people with a bipolar disorder diagnosis. Psychiatrische Praxis 2011;38 (S 01):S07_2_RE.
124. Russinova Z, Griffin S, Bloch P, Wewiorski NJ, Rosoklija I. Workplace prejudice and discrimination toward individuals with mental illnesses. J Voc Rehabilitation 2011;35 (3):227-41.
125. Gardner HH, Kleinman NL, Brook RA, Rajagopalan K, Brizee TJ, Smeeding JE. The economic impact of bipolar disorder in an employed population from an employer perspective. J Clin Psychiatry 2006;67 (8):1209-18.
126. Depression and Bipolar Support Alliance. Support or Stigma? Bipolar in the Workplace. 2008
127. Australian Journal of Pharmacy. Practice updates: Rising misconceptions about mental illness. Austr J Pharmacy 2011;92 (1091):29.
128. Schultz IZ, Milner RA, Hanson DB, Winter A. Employer attitudes towards accommodations in mental health disability. In: Schultz IZ, Rogers ES, editors. Work Accommodation and Retention in Mental Health. New York: Springer Science+Business Media; 2011. p. 325-40.
129. Reed C, Goetz I, Vieta E, Bassi M, Haro JM. Work impairment in bipolar disorder patients--results from a two-year observational study (EMBLEM). Eur Psychiatry 2010;25 (6):338-44.
130. Simon GE, Ludman EJ, Unützer J, Operskalski BH, Bauer MS. Severity of mood symptoms and work productivity in people treated for bipolar disorder. Bipolar Disord 2008;10 (6):718-25.
131. Kessler RC, Akiskal HS, Ames M, Birnbaum H, Greenberg P, Hirschfeld RMA, et al. The prevalence and effects of mood disorders on work performance in a nationally representative sample of US workers. Am J Psychiatry 2006;163 (9):1561.
132. Satz AB. Disability, vulnerability, and the limits of antidiscrimination. Wash L Rev 2008;83:513.
133. DBSA. Support or Stigma? Bipolar in the Workplace. 2008
134. Baldwin ML, Marcus SC. Stigma, discrimination, and employment outcomes among persons with mental health disabilities. In: (Eds.) IZSaESR, editor. Work Accommodation and Retention in

Mental Health. New York: Springer Science+Business Media; 2011. p. 53-69.
135. Krupa T. Employment and serious mental health disabilities. In: Schultz IZ, Rogers ES, editors. Work Accommodation and Retention in Mental Health. New York: Springer Science+Business Media; 2011. p. 91-101.
136. Larson JE, Ryan CB, Wassel AK, Kaszynski KL, Ibara L, Glenn TL, et al. Analyses of employment incentives and barriers for individuals with psychiatric disabilities. Rehabil Psychol 2011;56 (2):145-9.
137. Tse SS, Walsh AES. How does work for people with bipolar affective disorder? Occup Therapy Intl 2001;8 (3):210-25.
138. Silton NR, Flannelly KJ, Milstein G, Vaaler ML. Stigma in America: has anything changed? Impact of perceptions of mental illness and dangerousness on the desire for social distance: 1996 and 2006. J Nerv Ment Dis 2011;199 (6):361-6.
139. Corrigan PW, Roe D, Tsang HWH. Challenging the Stigma of Mental Illness: Lessons for Therapists and Advocates: Wiley; 2011.
140. Brohan E, Henderson C, Wheat K, Malcolm E, Clement S, Barley EA, et al. Systematic review of beliefs, behaviours and influencing factors associated with disclosure of a mental health problem in the workplace. BMC Psychiatry 2012;12 (1):11.
141. Morselli P, Elgie R, Cesana B. GAMIAN?Europe/BEAM survey II: cross?national analysis of unemployment, family history, treatment satisfaction and impact of the bipolar disorder on life style. Bipolar Disord 2004;6 (6):487-97.
142. Sharac J, Mccrone P, Clement S, Thornicroft G. The economic impact of mental health stigma and discrimination: a systematic review. Epidemiologia e Psichiatria Sociale 2010;19 (03):223-32.
143. Michalak EE, Yatham LN, Maxwell V, Hale S, Lam RW. The impact of bipolar disorder upon work functioning: a qualitative analysis. Bipolar Disord 2007;9 (1?2):126-43.
144. Elgie R, Morselli PL. Social functioning in bipolar patients: the perception and perspective of patients, relatives and advocacy organizations-a review. Bipolar Disord 2007;9 (1?2):144-57.
145. Lish JD, Dime-Meenan S, Whybrow PC, Price RA, Hirschfeld R. The National Depressive and Manic-depressive Association (DMDA) survey of bipolar members. J Affect Disord 1994;31 (4): 281-94.