



Psychology, Mental Health, and Quality of Life

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Behavioral medicine has multiple and varied connections with mental health.¹ Many in behavioral medicine have been trained in clinical psychology, psychiatry, social work, or other professions with a primary focus in the area. For others, interest in mental health emerges from the growing recognition of how a range of psychosocial factors, including mental health problems, contribute to the etiology and complicate disease prevention and management. For all, an integrated view of health problems generally includes psychological, social, and biological dimensions. Problems are best prevented and treated from such an integrative perspective.

Addressing all the issues involved in this area would require several books and, so, is far beyond the reach of this chapter. Here, we set out some of

the scope of the problems of mental health worldwide and then of interactions of mental health problems with prevention and care of other health problems, emphasizing maternal health and child development, diabetes, cardiovascular disease, cancer, and HIV/AIDS. We give substantial attention in this chapter to how we think about and conceptualize psychological problems and their roles in physical disease. An important area of progress is the inclusion of treatment for mental health problems in general healthcare systems, in contrast to being relegated to separate agencies, separate funding arrangements, separate treatment facilities, and separate professionals. A benefit of such integrative thinking may be recognition of how concepts previously thought limited to mental health, e.g., the role of early experience, social construction, and stigma, apply as well to other chronic diseases that have clearly biological

¹Throughout this chapter, “mental health” and “mental illness” are used as summary terms for a broad range of phenomena referred to by a variety of terms such as “psychopathology,” “abnormal behavior,” and “psychiatric disorder.” This usage is primarily pragmatic and not intended to convey or privilege any conceptual model as to the nature, causes, or fundamental characteristics of this broad range of phenomena.

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bases. At the same time, there are important ways in which schizophrenia, depression, anxiety disorders, personality disorder, and substance use disorder are *not* “just like any other illness.” The field is headed toward an integration built on shared themes and approaches, but not an assumption of equivalence of all instances.

This chapter closes with a description of some noteworthy approaches to treatment, prevention, and intervention around mental health and psychological aspects of health. The interventions included are a sample of a much larger field but are chosen to illustrate the innovative and integrative approaches emerging in the field. We start, however, with epidemiology.

Global Burden of Mental Health Problems

A 2009 review examined WHO World Mental Health (WMH) surveys in 28 countries. Across these, the inter-quartile range (25th to 75th percentiles) of lifetime prevalence of any of a combination of anxiety disorder, mood disorder, externalizing disorder, and substance use disorders (SUDs) was 18.1–36.1% and that for 12-month prevalence was 9.8–19.1%. “Serious disorders” include non-affective psychosis (including schizophrenia), bipolar disorder, substance dependence with a physiological dependence syndrome, suicide attempts, or substantial functional impairment. With this definition, 12.8–36.8% of those with any disorder were rated as serious (inter-quartile range = 18.5% to 25.7%) (Kessler, Aguilar-Gaxiola, et al., 2009). Table 32.1 presents some of the details of these global estimates, disaggregated by WHO region and individual countries contributing data to the report.

As described in Table 32.1, the lifetime prevalence of anxiety disorders (including agoraphobia, adult separation anxiety disorder, generalized anxiety disorder, panic disorder, post-traumatic stress disorder, social phobia, specific phobia) ranged from 4.8% in the People’s Republic of China to 31% in the USA. Similarly, the lifetime prevalence of mood disorders (including bipolar disorder, dysthymia, and major depressive disorder)

der) ranged from 3.6% in the People’s Republic of China to 21.4% in the USA. The lifetime prevalence of any disorder ranged from 12.0% in Nigeria to 47.4% in the USA.

Table 32.2 documents the disability-adjusted life years (DALYs) attributable to a variety of mental and neurological disorders (Collins, Patel, et al., 2011). According to the WHO (2016):

One DALY can be thought of as one lost year of “healthy” life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measure of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences.

That is: $DALY = YLL + YLD$

Disaggregating DALYs into years of life lost (YLLs) and years lost to disabilities (YLDs) shows important trends that underscore the importance of mental health. A 2015 study of global trends in mortality and disability (GBD 2013 Dalys, Hale Collaborators, et al., 2015) shows that, over the past decades, life expectancy has increased substantially, largely through improvements in treating communicable diseases. This results in general aging of the population. As the population ages, however, age-adjusted YLDs are not declining – that is, the likelihood of, e.g., an 80-year-old having disability from a health problem has not changed. There are two trends then that need to be understood: generally increasing life expectancy and stable age-adjusted rates of YLDs associated with mental health and substance use disorders as well as musculoskeletal, neurological, and hearing and vision disorders and diabetes. Together these have led to a greater total of YLDs and aggregate disease burden. The authors of the report point out important implications for behavioral medicine:

We believe that the historical focus of health research funding on causes of YLLs was probably appropriate. However, health progress now means that more research investment is needed for the disorders that debilitate, rather than kill. With each

Table 32.1 Lifetime prevalence estimates of DSM-IV/CIDI disorders in the WMH surveys^{a,b} (From: Kessler, Aguilar-Gaxiola, et al., 2009)

	Any anxiety disorder		Any mood disorder		Any externalizing disorder		Any substance disorder		Any disorder	
	%	(se)	%	(se)	%	(se)	%	(se)	%	(se)
I. WHO Region: Pan American Health Organization (PAHO)										
Colombia	25.3	(1.4)	14.6	(0.7)	9.6	(0.8)	9.6	(0.6)	39.1	(1.3)
Mexico	14.3	(0.9)	9.2	(0.5)	5.7	(0.6) ^c	7.8	(0.5)	26.1	(1.4)
USA	31.0	(1.0)	21.4	(0.6)	25.0	(1.1)	14.6	(0.6)	47.4	(1.1)
II. WHO Region: African Regional Office (AFRO)										
Nigeria	6.5	(0.9)	3.3	(0.3)	0.3	(0.1) ^{d,e}	3.7	(0.4)	12.0	(1.0)
South Africa	15.8	(0.8) ^{f,g}	9.8	(0.7) ^h	–	– ^{c,d,e,i}	13.3	(0.9)	30.3	(1.1)
III. WHO Region: Eastern Mediterranean Regional Office (EMRO)										
Lebanon	16.7	(1.6)	12.6	(0.9)	4.4	(0.9) ^e	2.2	(0.8)	25.8	(1.9)
IV. WHO Region: European Regional Office (EURO)										
Belgium	13.1	(1.9)	14.1	(1.0) ^h	5.2	(1.4) ^c	8.3	(0.9) ^j	29.1	(2.3)
France	22.3	(1.4)	21.0	(1.1) ^h	7.6	(1.3) ^c	7.1	(0.5) ^j	37.9	(1.7)
Germany	14.6	(1.5)	9.9	(0.6) ^h	3.1	(0.8) ^c	6.5	(0.6) ^j	25.2	(1.9)
Israel	5.2	(0.3) ^{f,g}	10.7	(0.5)	–	– ^{c,d,e,i}	5.3	(0.3)	17.6	(0.6)
Italy	11.0	(0.9)	9.9	(0.5) ^h	1.7	(0.4) ^c	1.3	(0.2) ^j	18.1	(1.1)
Netherlands	15.9	(1.1)	17.9	(1.0) ^h	4.7	(1.1) ^c	8.9	(0.9) ^j	31.7	(2.0)
Spain	9.9	(1.1)	10.6	(0.5) ^h	2.3	(0.8) ^c	3.6	(0.4) ^j	19.4	(1.4)
Ukraine	10.9	(0.8) ^{f,g}	15.8	(0.8) ^h	8.7	(1.1) ^{d,e}	15.0	(1.3)	36.1	(1.5)
V. WHO Region: Western Pacific Regional Office (WPRO)										
PRC ^k	4.8	(0.7)	3.6	(0.4)	4.3	(0.9) ^{d,e}	4.9	(0.7)	13.2	(1.3)
Japan	6.9	(0.6) ^f	7.6	(0.5)	2.8	(1.0) ^{d,e,i}	4.8	(0.5)	18.0	(1.1)
New Zealand	24.6	(0.7) ^f	20.4	(0.5)	–	– ^{c,d,e,i}	12.4	(0.4)	39.3	(0.9)

^aAnxiety disorders include agoraphobia, adult separation anxiety disorder, generalized anxiety disorder, panic disorder, post-traumatic stress disorder, social phobia, and specific phobia. Mood disorders include bipolar disorders, dysthymia, and major depressive disorder. Impulse control disorders include intermittent explosive disorder and reported persistence in the past 12 months of symptoms of three child-adolescent disorders (attention-deficit hyperactivity disorder, conduct disorder, and oppositional defiant disorder). Substance disorders include alcohol or drug abuse with or without dependence. In the case of substance dependence, respondents who met full criteria at some time in their life and who continue to have any symptoms are considered to have 12-month dependence even if they currently do not meet full criteria for the disorder. Organic exclusions were made as specified in the *Diagnostic and Statistical Manual of Mental Health Disorders*, Fourth Edition

^bImpulse disorders restricted to age ≤ 39 (China, Ukraine, Nigeria) or to age ≤ 44 (all other countries)

^cIntermittent explosive disorder was not assessed

^dAttention-deficit hyperactivity disorder was not assessed

^eOppositional defiant disorder was not assessed

^fAdult separation anxiety disorder was not assessed

^gSpecific phobia was not assessed

^hBipolar disorders were not assessed

ⁱConduct disorder was not assessed

^jOnly alcohol abuse with or without dependence was assessed. No assessment was made of other drug abuse with or without dependence

^kPeople's Republic of China

passing year, the shift towards YLDs as the leading causes of disease burden will be more evident. Action is needed now to develop preventive, curative, and ameliorative strategies for these conditions rather than waiting until this shift is even more obvious. (GBD 2013 Dalys, Hale Collaborators, et al., 2015, p. 2182)

Mental Health and Chronic Disease

Surveys from six low- and middle-income countries (China, Ghana, India, Mexico, Russia, and South Africa) examined the prevalence and

Table 32.2 Global burden of mental, neurological, and substance use disorders (millions of lives affected) and rank of causes worldwide and disaggregated by high- and low-/middle-income countries^a (Adapted from Collins, Patel, et al., 2011)

Rank	Worldwide		High-income countries		Low- and middle-income countries	
	Cause	Millions	Cause	Millions	Cause	Millions
1	Unipolar depressive disorders	65.5	Unipolar depressive disorders	10.0	Unipolar depressive disorders	55.5
2	Alcohol use disorders	23.7	Alzheimer’s and other dementias	4.4	Alcohol use disorders	19.5
3	Schizophrenia	16.8	Alcohol use disorders	4.2	Schizophrenia	15.2
4	Bipolar affective disorder	14.4	Drug use disorders	1.9	Bipolar affective disorder	12.9
5	Alzheimer’s and other dementias	11.2	Schizophrenia	1.6	Epilepsy	7.3
6	Drug use disorders	8.4	Bipolar affective disorder	1.5	Alzheimer’s and other dementias	6.8
7	Epilepsy	7.9	Migraine	1.4	Drug use disorders	6.5
8	Migraine	7.8	Panic disorder	0.8	Migraine	6.3
9	Panic disorder	7.0	Insomnia (primary)	0.8	Panic disorder	6.2
10	Obsessive-compulsive disorder	5.1	Parkinson’s disease	0.7	Obsessive-compulsive disorder	4.5
11	Insomnia (primary)	3.6	Obsessive-compulsive disorder	0.6	Post-traumatic stress disorder	3.0
12	Post-traumatic stress disorder	3.5	Epilepsy	0.5	Insomnia (primary)	2.9
13	Parkinson’s disease	1.7	Post-traumatic stress disorder	0.5	Multiple sclerosis	1.2
14	Multiple sclerosis	1.5	Multiple sclerosis	0.3	Parkinson’s disease	1.0

^aWorld Bank criteria for income (2009 gross national income (GNI) per capita): low income is equivalent to US\$995 or less; middle income is \$996–12,195; high income is \$12,196 or more

impacts of multimorbidity, defined as two or more of eight common chronic diseases (angina pectoris, arthritis, asthma, chronic lung disease, diabetes mellitus, hypertension, stroke, and vision problems) (Arokiasamy, Uttamacharya, et al., 2015). The prevalence of multimorbidity was 21.9%, ranging from as low as 20.3% in China to as high as 34.7% in Russia. As expected, multimorbidity increased with age and decreased with greater socioeconomic status. Moreover, the number of chronic diseases was associated with greater depression, poorer self-rated health, and more limitations in activities of daily living (ADLs).

Amidst the many forms in which mental health issues complicate health and illness, several stand out: depression, anxiety disorders, substance use disorders, personality disorders, psychological distress, and serious mental illness. We review here the epidemiology of each of these.

Epidemiology of Major Depression Depression is a common mental disorder. WHO estimated that the 12-month prevalence of mood disorders (including different subtypes of depression) in developed countries was between 3.1% (Japan) and 9.6% (USA).

Lifetime prevalence estimates for depression are as high as 21%, with a preponderance in women. Depression affects both an individual's personal life and the society as a whole. The estimated lifetime prevalence of suicide in patients with depression is between 2% (outpatients) and 6% (inpatients). A first episode of depression often occurs early in life; the median age of onset for mood disorders ranges from 25 to 31 years. The natural course of depression varies substantially between patients. Some patients have a full remission after an index episode (20%), many have either residual symptoms (12%) or recurrence after full remission (40%), and chronicity is rather high (28%). Furthermore, interindividual differences in the duration of a depressive episode are large, with a median duration of 3 months. However, the distribution is skewed toward much longer episodes, and nearly 20% of patients do not recover within 24 months. Furthermore, each depressive episode leads to increased damage on psychological, biological, and social levels, which further increases an individual's vulnerability for another depressive episode.

Thus, large heterogeneity exists in the natural course of patients presenting with depression, with a subgroup of patients having persistent or recurrent episodes.

Risk factors for the onset of depression include social factors, such as low education, social defeat, and loneliness; psychological factors, such as a high degree of neuroticism, early life stressors, and minor depressive complaints; and biological factors, such as genetic risk, specific medication and recreational drugs, and physical illness. Epidemiological data suggest that any medical chronic disease carries an additional risk factor for depression. In the USA, Egede (2007) showed that the risk for major depression was increased 2.6 times if a somatic disease was present, with a prevalence of comorbid depression ranging from 7.9% in patients with heart failure to 17% in patients with end-stage renal disease. The WHO World Mental Health Survey reported on depression prevalence based on ICD-10 criteria from 60 countries in all regions of the world and found a significantly higher prevalence of

depression in people with at least one comorbid somatic complication (23%) than in people without comorbid somatic complication (3%) (Demyttenaere, Bruffaerts, et al., 2004).

Anxiety Disorders The US National Institute of Mental Health defines anxiety disorder as worry or fear that does not go away and may worsen over time, causing significant impairment to an individual's life (National Institute of Mental Health, 2015). According to the *Diagnostic and Statistical Manual of the American Psychiatric Association*, Fifth Edition (2014), anxiety disorders include separation anxiety disorder, selective mutism, specific phobia, social anxiety disorder, panic disorder, agoraphobia, generalized anxiety disorder, anxiety due to medical conditions or substances, and other/unspecified anxiety disorders (Anxiety and Depression Association of America, 2015). This category is separate from obsessive-compulsive disorders and trauma or stressor-induced disorders (Regier, Kuhl, & Kupfer, 2013). Anxiety, particularly generalized anxiety disorder (GAD), often coincides with major depression (Moscati, Flint, & Kendler, 2016), and the DSM-5 includes a new diagnostic category, "mixed anxiety/depression" (American Psychiatric Association, 2014).

The Global Burden of Disease Study estimates indicate that of the 183.9 million disability-adjusted life years (DALYs) attributed to mental and substance use disorders, 14.6% are attributable to anxiety disorders (Whiteford, Degenhardt, et al., 2013). The estimate of the current global prevalence of anxiety disorders is 7.3%, which corresponds to approximately 1 in 14 people experiencing an anxiety disorder at any given time (Baxter, Scott, et al., 2013). Globally, women are nearly twice as likely to have an anxiety disorder as men. In a sample of adults from the USA ($N = 20,013$), women had significantly higher rates of panic disorder (OR = 1.70, $p < 0.05$), agoraphobia (OR = 1.46, $p < 0.05$), generalized anxiety disorder (OR = 1.83, $p < 0.05$), and specific phobia (OR = 1.96, $p < 0.05$) (McLean, Asnaani, et al., 2011). Anxiety disorders are also more prevalent in younger adults (ages 35–54, who later may "grow

out' of them), Euro/Anglo cultures, developed countries, and conflict populations (Whiteford, Degenhardt, et al., 2013).

Anxiety disorders are believed to run in families, with twin studies yielding heritability estimates of 30–40% (Rapee, 2012). While there does appear to be a genetic component in anxiety disorders, the influence of genetics does not appear to be as strong as is observed in other disorders, such as substance use disorders and schizophrenia. One consistent and well-documented environmental risk factor is childhood sexual abuse. Other factors related to parent-child interactions, such as overprotectiveness, may also serve as risk factors.

Anxiety disorders pose an enormous burden to both mental and physical health (Comer, Blanco, et al., 2011). In their study of over 43,000 US adults, Comer et al. (2011) found that individuals diagnosed with an anxiety disorder scored significantly lower on multiple dimensions of a health survey when compared to individuals without an anxiety disorder. As a group, individuals with anxiety disorders were significantly more likely to report hypertension, angina, tachycardia, ulcers, gastritis, arthritis, poor social functioning, limitations due to emotional problems, and lower overall well-being. Of all the anxiety disorders, GAD posed the greatest challenges to health. Individuals with GAD reported significantly more medical comorbidities, especially non-cirrhotic liver disease and heart disease other than myocardial infarction.

The relationship between anxiety disorders and cardiovascular illness has been documented in other recent studies. In a study of 1015 adults with coronary heart disease at an outpatient clinic, individuals with GAD experienced a significantly higher rate of cardiovascular events (HR = 1.62, $p < 0.01$) (Martens, de Jonge, et al., 2010). This relationship was maintained even when controlling for health behaviors, disease severity, and biological mediators. Similarly, a meta-analysis of individuals with coronary heart disease found that individuals suffering from anxiety were at a significantly higher risk of cardiac death than non-anxious persons (HR = 1.26, $p < 0.0001$) (Roest, Martens, et al., 2010).

Substance Use Disorders Substance use disorders (SUDs) occur when frequent use of a particular substance results in significant impairment or problems in various areas of life, such as health, work, or relationships (U.S. Department of Health and Human Services, 2015). The DSM-5 combines different categories of abuse and dependence into one disorder, with severity measured on a continuum (American Psychiatric Association, 2014). Common SUDs include alcohol use disorder, tobacco use disorder, cannabis use disorder, stimulant use disorder, hallucinogen use disorder, and opioid use disorder (U.S. Department of Health and Human Services, 2015).

Data from the 2010 Global Burden of Disease, Injuries, and Risk Factors study indicated that mental and substance use disorders were the primary causes of years lost to disability (YLDs), with illicit drug use disorders accounting for 10.9% and alcohol use disorders for 9.6% of all disability-adjusted life years (DALYs) caused by mental and substance use disorders (Whiteford, Degenhardt, et al., 2013). Of the 8.6 million years of life lost (YLLs) to mental and substance use disorders, 81.1% resulted specifically from SUDs. Although the worldwide prevalence of most mental disorders remained fairly stable between 1990 and 2010, SUDs increased significantly during this time. Young adults account for the largest proportion of the global burden, with peak prevalence occurring between ages 20 and 29 (Merikangas & McClair, 2012).

A major risk factor for SUDs is family history; children of substance abusers are two times as likely to develop a substance use disorder as children of non-abusers, and this risk is even higher when the substance involved is alcohol or marijuana (Merikangas & McClair, 2012). Males are significantly more likely to have a substance use disorder than females, and individuals who frequently use or abuse a variety of substances (polysubstance abuse) are more likely to develop SUDs than individuals who only use one substance. Experiencing stressful life events such as losing a job, divorce, terrorism, and natural disasters is associated with increased substance use (Keyes, Hatzenbuehler, & Hasin, 2011). Adverse

childhood experiences, particularly childhood maltreatment, consistently predict subsequent development of SUDs across studies (Enoch, 2011; Keyes, Hatzenbuehler, & Hasin, 2011). In young adults, additional risk factors include peer substance use, low academic achievement, moving away from home, and attending college, while protective factors include work, marriage, and graduating from college (Stone, Becker, et al., 2012).

SUDs frequently co-occur with other mental disorders and can severely impact health in a number of ways (U.S. Department of Health and Human Services, 2015). For example, individuals with SUDs are significantly more likely to be infected with HIV than individuals without SUDs (Prince, Walkup, et al., 2012). They are also significantly less likely to adhere to a prescribed medication regimen for type 2 diabetes (Kreyenbuhl, Dixon, et al., 2010) as well as for schizophrenia and bipolar disorder (Jónsdóttir, Opjordsmoen, et al., 2013). Pregnant women who abuse substances are more likely to miscarry and deliver prematurely than non-abusers (Gopman, 2014; Wendell, 2013). Tobacco use during pregnancy is one of the leading causes of preventable infant mortality and morbidity (Wendell, 2013). Alcohol abuse during pregnancy also results in poor birth outcomes, including fetal alcohol syndrome. Preventing the onset and reducing the prevalence of SUDs are therefore a priority for improving both mental and physical health outcomes.

Personality Disorders Individual differences in character, habitual ways of thinking, feelings, and behaviors are part of normal variation. When individual characteristics are manifest in a maladaptive manner, they are clinically identified as personality disorders. Intrinsic to such a definition is the social context within which these behaviors occur, since acceptable behavioral patterns vary across social contexts (Newlin & Weinstein, 2015). For example, highly submissive and deferential behavior may be required in some relationships and cultures but may be dysfunctional and socially unacceptable in other relationships and cultures. Personality disorders are common,

estimated to occur among 10% of the general population, and even more common in clinical populations as they coexist often with chronic diseases and health problems (Samuels, 2011).

The DSM-5 currently identifies 10 types of personality disorder: paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant, dependent, and obsessive-compulsive (American Psychiatric Association, 2014). These are classified into three categories or clusters: cluster A (paranoid, schizoid, schizotypal) characterized by odd, eccentric, aloof, paranoid, or bizarre thinking; cluster B (antisocial, borderline, histrionic, narcissistic) characterized by instability of behavior, mood, and relationships; and cluster C (avoidant, dependent, and obsessive-compulsive) characterized by obsessive, fearful, or anxious thoughts. However, definitions and distinctions among these are difficult, and alternative ways of grouping and characterizing them remain controversial and the object of discussion and research (Gotsche-Astrup & Moskowitz, 2016; Widiger, 2015).

Personality disorders are associated with poorer outcomes and higher healthcare utilization across a wide range of health problems. One systematic review found personality disorders associated with sleep disturbances, back pain, incontinence, chronic pain, obesity, and varied chronic health conditions including allergic rhinitis, arthritis, asthma, cardiovascular disease, diabetes, gastrointestinal disease, HIV+ status, hypertension, ischemic heart disease, liver disease, stroke, and venereal disease (Dixon-Gordon, Whalen, et al., 2015). In national surveys from the USA including 34,653 adults, a variety of personality disorders were associated with cardiovascular disease, arthritis, diabetes, and gastrointestinal conditions (Quirk, El-Gabalawy, et al., 2015). In a recent systematic review of health service utilization among those with mental disorders in the UK (Twomey, Baldwin, et al., 2015), the presence of a personality disorder, in addition to neurotic symptoms, comorbidity, and several demographic characteristics, were among the variables shown to predict a variety of types of health and behavioral health service utilization, including primary care contacts, medication

usage, contacts with psychiatrists, attendance at psychotherapy, inpatient days, accident and emergency admissions, and a total service utilization score.

Interpersonal problems are at the core of personality disorders (Hengartner, von Wyl, et al., 2015) and especially those identified as “borderline personality,” characterized by extremely labile relationships and frequent vacillation between all-or-none negative and positive views of self and others. As a result, patients with personality disorders and especially borderline personality presenting in medical settings are often experienced as “difficult” or “high maintenance.” This may be related to insecure/avoidant or disorganized attachment styles characterized by fear of abandonment and also fear of closeness (Bowlby, 1980; van Dijke & Ford, 2015). Importantly, individuals with personality disorders are often not aware of the impact of their behavior on others, and working with them requires a willingness to understand their perspective while maintaining appropriate boundaries (Newlin & Weinstein, 2015). As personality disorders often co-occur with other mental health as well as medical diagnoses, treatment involves multiple components.

For borderline personality disorder and cluster B (antisocial, borderline, histrionic, narcissistic), there is evidence that psychological therapies and in particular dialectic behavior therapy are beneficial. A Cochrane review concluded that findings “support a substantial role for psychotherapy in the treatment of people with BPD [Borderline Personality Disorder] but clearly indicate a need for replicatory studies” (Stoffers, Vollm, et al., 2012). Although frequently prescribed, there is little evidence for the effectiveness of psychopharmacological treatment in this patient group (Stoffers & Lieb, 2015) although medication may be helpful for other problems not part of personality disorder per se (Kendall, Pilling, et al., 2009).

Psychological Distress In addition to the specific kinds of disorders detailed in the preceding paragraphs, general psychological distress has emerged as an important consideration in behav-

ioral medicine and especially in chronic disease management. The term distress was introduced in the early 1970s by the Hungarian physiologist Hans Selye to distinguish between stress initiated by negative, unpleasant stressors and positive stress (eustress). Psychological distress is conceptualized as a measure of current state as opposed to a static, personality trait. Thus, it is treated as a continuous variable that can vary in response to different stressful situations and was defined by Ridner as “the unique discomforting, emotional state experienced by an individual in response to a specific stressor or demand that results in harm, either temporary or permanent to the person” (Ridner, 2004). The harm mentioned in this definition refers to negative emotions, such as irritability, fear, nervousness, and sadness, which are burdensome in their own right, associated with low well-being and social functioning, but are not necessarily pathological. Thus, distress is defined as an emotional response toward adverse or unpleasant stressors, whereas the definition of depression is based solely on a count of symptoms, irrespective of cause or context.

Increased psychological distress (or simply distress) is prevalent in medical patients and is often regarded as a normal response to the burden of diagnosis and treatment, discomforting symptoms, and negative social implications. As noted by De Ridder and colleagues (de Ridder, Geenen, et al., 2008), chronic illness challenges patients’ habitual coping strategies. Although most eventually reach good psychological adjustment, for about 30% the adjustment phase is long lasting or unsuccessful. In a community-dwelling Japanese population, Nakaya et al. (2014) noted increased nonspecific psychological distress in people with self-reported somatic diseases compared with people claiming to have no somatic disorder. The risk of psychological distress was increased by 20% for hypertension and hyperlipidemia; 30% for diabetes; 50% for cancer; 60% for myocardial infarction, arthritis, and osteoporosis; and 130% for stroke (Nakaya, Kogure, et al., 2014). The differences in prevalence across these different diseases suggest a role for disease characteristics such as prognosis, symptom burden, and specific

treatment requirements. Epidemiological studies of depression in different somatic patient populations might offer opportunities for research into causes looking into shared psychological (e.g., coping) and biological (e.g., inflammation, hypothalamic-pituitary-adrenal axis) pathways across different medical disorders.

Serious Mental Illness Serious mental illness is defined by the conjunction of diagnosis, duration, and disability (Goldman, Gattozzi, & Taube, 1981; U.S. Department of Health and Human Services, 2014). More specifically, serious mental illness is defined as (a) a mental, behavioral, or emotional disorder that is currently diagnosable or diagnosable within the previous 12 months, (b) of sufficient duration to meet diagnostic criteria as outlined in current diagnostic and statistical manuals, and (c) resulting in functional impairment which limits one or more major life activities, such as school or work (U.S. Department of Health and Human Services, 2014). Qualifying diagnoses often include especially debilitating disorders such as schizophrenia, bipolar disorder, or major depression. Other disorders such as anxiety disorder, post-traumatic stress disorder (PTSD), and obsessive-compulsive disorder may also be included. Developmental and substance use disorders, however, are not qualifying diagnoses for serious mental illness. Disability can be indicated by *eligibility* for social services such as, in the US Supplemental Security Income (SSI) or Social Security Disability Income (SSDI). (Because the process of enrolling in these programs can take years, eligibility rather than coverage is taken as the criterion for disability.) Duration can be defined in terms of a single episode of psychiatric hospitalization in the previous 5 years of at least 6 months or two or more hospitalizations within a year (Goldman, Gattozzi, & Taube, 1981).

In 2013 in the USA, for example, there were an estimated 10 million adults – or 4.2% of all US adults – aged 18 or older with diagnosed serious mental illness within the previous 12 months (U.S. Department of Health and Human Services, 2014). Best current estimates suggest a lifetime prevalence of bipolar disorder to be approxi-

mately 2.6% of all US adults, 9.1% for depressive disorders, and 1% for schizophrenia and other psychotic disorders (U.S. Department of Health and Human Services, 2014). Furthermore, recent prevalence data suggest that nearly 40 million people in the USA (18%) experience an anxiety disorder in any given year, and over 7 million adults in the USA could be diagnosed as having PTSD at any given time (U.S. Department of Health and Human Services, 2014).

Persons with serious mental illness have high rates of co-occurring substance use disorders. Estimates suggest that up to 8.4 million adults in the USA have co-occurring serious mental illness and substance use disorder (U.S. Department of Health and Human Services, 2014). For many persons with serious mental illness, the combination of untreated mental illness and substance use can be associated with a number of poor outcomes, including violence, treatment and medication nonadherence, difficulty accessing much-needed social and medical services, homelessness, and frequent criminal justice contacts (Clark, Ricketts, & McHugo, 1999; Drake & Mueser, 2001; Horsfall, Cleary, et al., 2009; Steadman, 2000; Theriot & Segal, 2005). Moreover, individuals with serious mental illness who are also involved with the justice system have difficulty accessing housing and social services and have high recidivism rates (Cloyes, Wong, et al., 2010; Gagliardi, Lovell, et al., 2004; Lovell, Gagliardi, & Peterson, 2002; Mallik-Kane & Visher, 2008; Skeem & Louden, 2006).

Persons with serious mental illness have higher rates of chronic health conditions and a reduced life expectancy compared to the general population (Chwastiak, Rosenheck, et al., 2006; Colton & Manderscheid, 2006; Daumit, Pratt, et al., 2002; Dickey, Normand, et al., 2002; Hansen, Arnesen, & Jacobsen, 1997; Joukamaa, Heliövaara, et al., 2006). Compared to the general population, for example, persons with schizophrenia are at greater risk for colon and breast cancers (Hippisley-Cox, Vinogradova, et al., 2007). Among the persons with serious mental illness, heart disease remains the leading cause of death (Dembling, Chen, & Vachon, 1999; Saha,

Chant, & McGrath, 2007). Those diagnosed with schizophrenia also have an increased risk of metabolic syndrome and type 2 diabetes, explained both by lifestyle factors and metabolic effects of antipsychotic medication (Olsson, Westman, et al., 2015; Ward & Druss, 2015).

In addition to the heightened likelihood of disease, the physical health needs of persons with mental illness often go unmet (Colton & Manderscheid, 2006; Druss, Rosenheck, et al., 2002; Salsberry, Chipps, & Kennedy, 2005). There is a speculation that the unmet physical health needs of persons with severe mental illness are due to problems in both primary care and specialty mental healthcare. Primary care providers may view care for persons with serious mental illness as too specialized for primary care (Lester, Tritter, & Sorohan, 2004). On the other hand, mental healthcare providers may lack training and confidence to treat the medical problems of persons with serious mental illness (Unützer, Schoenbaum, et al., 2006). These barriers may be joined by a combination of consumer, provider, and system-level factors (Druss, Rosenheck, et al., 2002), supported by clinical guidelines endorsed by both primary care and mental health professionals (e.g., de Hert, Dekker, et al., 2009).

Key Life Course Phases

There are several areas and points in the lifespan in which mental health issues are especially important in general health and well-being. Here we will highlight three phases: parental health and early child development, adolescence, and adult development and aging.

Parental Health and Child Development

Childhood environment, including parental mental health, parental attachment and parenting styles, and socioeconomic status, impacts child development and subsequent mental and physical

health. Mental health problems such as depression or substance use may be linked with parenting characteristics such as neglect that then impact childhood development (Hanington, Ramchandani, & Stein, 2010; Norman, Byambaa, et al., 2012). These parental characteristics can place a child at future risk for a myriad of poor health outcomes, including a range of mental disorders, drug use, and sexually transmitted infections (Hanington, Ramchandani, & Stein, 2010; Norman, Byambaa, et al., 2012). Conversely, a positive childhood environment, characterized by authoritative and attentive parents, can foster healthy psychosocial development and both mental and physical health (Kiuru, Aunola, et al., 2012; Steinberg, Elmen, & Mounds, 1989; Vollmer & Mobley, 2013).

Parental Mental Health Numerous adult health problems are linked to parental characteristics that subsequently have an impact on childhood development. Chief among these health issues is parental depression. Research has demonstrated that maternal mental health problems in pregnancy and/or postpartum place children at risk for poor global, behavioral, cognitive, and socioemotional development (Kingston & Tough, 2014). As recently reviewed by Atif and colleagues, the prevalence of prenatal depression averages 15.6% and postnatal 19.8% and is associated with a number of problems, including preterm birth, low birth weight, and poor infant growth and cognitive development (Atif, Lovell, & Rahman, 2015). Negative impacts are not only associated with maternal depression but paternal depression as well. Parental depression impacts cognitive and socioemotional development in children, both directly and indirectly (Cummings, 1994). Directly, parental depression affects the parent's emotions, thoughts, and behaviors, which in turn influences child development (Cummings, 1994; Hanington, Ramchandani, & Stein, 2010). For example, depressed parents exhibit more unsupportiveness, negativity, and intrusiveness toward their children compared to nondepressed parents (Field, Healy, et al., 1990; National Research Council (US) and Institute of Medicine (US) Committee on Depression, 2009; Zajicek & De

Salis, 1979). Parental depression may enter into relationships with children through criticism, disengagement, lack of responsiveness, coldness, and physical abuse (Panaccione & Wahler, 1986; Webster-Stratton, 1990). A child's prolonged exposure to these, in turn, has been linked to the development of childhood depressive behavior (Cohn, Campbell, et al., 1990; Hanington, Ramchandani, & Stein, 2010). More indirectly, parental depression may affect children by altering patterns of parent-child attachment and interaction (Cummings, 1994), discussed in the next section.

Parental Attachment and Parenting Styles Parental attachment and parenting styles have important impacts on child development and health. Bowlby described how children naturally seek proximity to caregivers in times of need, developing attachment relationships (Bowlby, 1976, 1980). He also noted differences in attachment systems, including secure and insecure attachment. Parental warmth, sensitivity, and responsiveness to bids for support and proximity facilitate secure attachment and build positive mental representations of self and others (Cummings & Cicchetti, 1993; Zeanah & Zeanah, 1989). This formation of secure attachment fosters a child's development and well-being (Mikulincer & Shaver, 2012). However, when a child's caregivers are not reliably available or supportive, insecure attachments result in children viewing others as unreliable and themselves as unworthy (Bretherton, 1985) and lacking self-efficacy (White, 1959). These may in turn lead to childhood depression (Mikulincer & Shaver, 2012) and numerous other disadvantageous patterns of development.

In addition to child-parent attachment, parenting styles have been identified as a way of understanding child development. Psychologist Diana Baumrind identified three major parenting styles – permissive, authoritative, and authoritarian – each with different impacts on child behavior (Baumrind, 1966). Permissive or “laissez faire” parenting is nonpunitive, accepting, and indulgent of children's impulses, desires, and actions. This style creates few expectations for

children and, so, may lead to increased aggression and unscrupulous behaviors (Baumrind, 1966). Contrasting sharply with the permissive style, an authoritarian style attempts to control children's behaviors and attitudes with close supervision and high demands. These may foster rebelliousness, passivity and dependence, or low self-assertiveness. In addition to these two styles is authoritative parenting. This directs children's activities in a rational, issue-oriented manner while also encouraging autonomy and self-will (Baumrind, 1966). The warm, firm, and fair parenting characterized by authoritative parentings leads to healthy psychological adjustment (Gray & Steinberg, 1999).

Socioeconomic Status, Parenting, and Child Development As is well known, low socioeconomic status (SES) has a significant influence on mental and physical health. Research has examined how the influence of SES begins in childhood. Children of lower SES have higher rates of many diseases and risk factors for disease (Colhoun, Hemingway, & Poulter, 1998; Hegewald & Crapo, 2007; Wright & Subramanian, 2007). The realities of low SES teach persistent patterns of responding to threatening, negative, or ambiguous stimuli in a manner that leads to more and stronger stress responses compared to children of higher SES (Chen, Langer, et al., 2004). This accentuates stress and can induce significant biological changes in children through increasing allostatic load, which can exert long-term effects on physical and mental health (Danese & McEwen, 2012). Essentially, the allostatic load is a body's cumulative wear and tear; it is the physiological consequence of chronic exposure to stress (McEwen & Stellar, 1993). It serves as the mediator through which the chronic stress many children of low SES face negatively impacts their subsequent physical and mental health.

SES not only has an impact on childhood development through the stress response but also through the early resources that are denied as a result of this status. Proper nutrition during infancy and toddlerhood are essential because these periods are critical for growth and brain development; insufficient energy and nutrients

during this time may negatively impact the structural and functional development of the child's brain (Uauy & Dangour, 2006). Research has illustrated that mothers with a lower education level are more likely to have poor infant feeding practices than their more highly educated counterparts, thereby potentially impeding their children's growth and brain development (Emmett & Jones, 2014). Putting these several streams together, low SES may lead to poorer mental and physical health outcomes as a result of both fostering stress and limiting critical resources.

Adolescent Development

Adolescence is an age of both learning and confusion. Because this transitional time allows individuals to explore independence and self-identity, it forces youth to face dilemmas that were previously unknown. Adolescents navigate new issues – sexuality, drugs, alcohol, and socialization – at the same time, they are working to form a clear identity. It follows that emotional distress is an important component of the adolescent experience and adolescent health (Merikangas, He, et al., 2010).

Adolescent behaviors and development have often been framed in terms of the importance of peer influence, social modeling, and observational learning (Carter, Bingham, et al., 2014; Cruwys, Bevelander, & Hermans, 2015; Gerbasi, Richards, et al., 2014; Suleiman & Deardorff, 2015). These factors are significant especially in the roles they play in encouraging or discouraging many risk behaviors in adolescence. We must not ignore, however, the influence of an adolescent's psychological experience and mental health. Here, we explore the emotional aspects of adolescent health and development. Because adolescence is an age of discovery and exploration, it is also an age of increased susceptibility to psychological distress. This distress can have negative impacts on development, physiological health, health behaviors, and overall mental and social well-being. This transitional time is critical to healthy development and the formation of healthy habits that persist into adulthood.

A person's self-concept encompasses beliefs about one's self, such as academic performance, gender identity, sexuality, and ethnicity (Shavelson, Hubner, & Stanton, 1976). These beliefs can significantly change during adolescence due to increased self-consciousness and peer influence (Sebastian, Burnett, & Blakemore, 2008). However, stress may also have a significant impact on self-concept. There are numerous sources of stress and anxiety for adolescents – including academic pressures, bullying, self-esteem issues, and body consciousness – that can manifest as a negative self-concept (Benedict, Vivier, & Gjelsvik, 2015; Rawana & Morgan, 2014; Wenz-Gross, Siperstein, et al., 1997). For instance, high academic stress and low emotional support are related to a low academic self-concept, and high peer stress and low peer companionship are associated with low social self-concept (La Greca & Harrison, 2005; Michie, Glachan, & Bray, 2001; Wenz-Gross, Siperstein, et al., 1997). In addition to its importance in its own right, a negative self-concept damages mental and social well-being. It is associated with a broad range of mental and social disorders including depression, suicidal tendencies, eating disorders, anxiety, violence, and substance abuse (Mann, Hosman, et al., 2004; Rosenberg, 1985).

Unfortunately, such disorders are common. Anxiety disorders are the most common mental disorder in adolescents, with nearly a third of adolescents suffering from them, followed by behavior disorders, mood disorders, and substance use disorders, as per DSM-IV (K. R. Merikangas, He, et al., 2010). Approximately 40% of adolescents with one class of disorder also meet criteria for another class. These disorders can be debilitating – over one in five adolescents with a mental disorder suffer severe impairment and/or distress (Merikangas, He, et al., 2010).

There is a patterned distribution of mental disorders across adolescents. Mood and anxiety disorders are more prevalent among females, whereas males have higher rates of behavior and substance use disorders (Merikangas, He, et al., 2010). With respect to parental characteristics, the prevalence rates of anxiety disorders, substance use disorders, and behavior disorders are

higher for adolescents whose parents are divorced or separated compared to married or cohabitating (Merikangas, He, et al., 2010). Lastly, adolescents whose parents are not college graduates have an increased risk for all disorders (Merikangas, He, et al., 2010).

Numerous biological factors both drive and result from adolescent psychological distress. During this life stage, there is an increased responsiveness to sex and stress hormones, and these hormones may influence the risk for mental disorders via their effect on dopamine neurotransmission that is important in feelings of enjoyment and motivation (Sinclair, Purves-Tyson, et al., 2014). With regard to the biological effects that result from psychological distress, the adolescent brain may be particularly sensitive to stress with important consequences on an individual's immediate and long-term health and well-being. There is strong evidence that stress exposure during adolescence can lead to short- and long-term changes in limbic and cortical structure and function, with important behavioral repercussions (Eiland & Romeo, 2013). Beyond its effects on the brain, psychological distress has additional physiological impacts. Even as early as the pre-teenage years, stress increases systolic blood pressure and assists the formation of arterial plaque, placing an individual at higher risk for cardiovascular disease later in life (Roemmich, Lambiase, et al., 2014).

Not only is psychological distress disagreeable in itself and through its direct biological affects, but it can have poor repercussions on adolescents' health behaviors. For instance, stress promotes unhealthy behaviors, including snacking on unhealthy foods and reduced physical activity, which places an individual at risk for obesity (Roemmich, Lambiase, et al., 2014). Furthermore, distress and negative health behaviors such as substance use, risky sexual behaviors, and eating disorders often co-occur (Santos, Richards, & Bleckley, 2007; Waller, Hallfors, et al., 2006). Depression, eating disorder, and substance abuse symptoms tend to increase over time during adolescence, and increases in each of these symptoms are associated with increases in other symptoms (Measelle, Stice, & Hogansen,

2006; Merikangas, He, et al., 2010). In particular, depression has been shown to predict increases in eating disorders and substance abuse symptoms (Measelle, Stice, & Hogansen, 2006; Santos, Richards, & Bleckley, 2007).

The influence of psychological distress on health behaviors is especially important in adolescents facing chronic conditions (Bender, 2006). For this population, depression and risk behaviors may be associated with nonadherence to medications, poor treatment outcomes, and even death (Bender, 2006). In a study of the Pediatric Diabetes Consortium registries, depressive symptoms were found in 13% of adolescents with type 1 and 22% of adolescents with type 2 diabetes (Silverstein, Cheng, et al., 2015). Stress may have negative indirect effects on glycemic control in adolescents with diabetes via stress's impact on diabetes treatment and monitoring, such as nonadherence to meal and exercise plans (Marcovecchio & Chiarelli, 2012). In adolescents with asthma, depression might lead to hopelessness that interferes with adherence and other health-promoting behavior, and depression may even impact asthma directly via altering immune response (Bender, 2006).

Older Adulthood

Setting the stage for psychological development in older adulthood (usually defined as age 55 and above) is a pattern of declining capacity in many domains. Because of an inverted U pattern of development of many cognitive and physical abilities, risks for health problems increase with advanced age. Yet structural factors such as gender, class, and ethnicity also influence health across the lifespan, so that, for example, older adults at high socioeconomic status will tend to be healthier than midlife adults at low socioeconomic status (Connell & Janevic, 2003). Additionally, older adults tend to be more likely to engage in many positive health behaviors. An important demonstration of the capacity of older adults to adopt healthy behaviors was in the Diabetes Prevention Program. The relative advantage of its lifestyle condition (loss of 7%

bodyweight and 150 min of moderate physical activity per week) relative to metformin was greater than among younger participants (minimum age = 25 years, mean across conditions = 50.6) (Diabetes Prevention Program Research Group, 2002).

The declines that accompany aging have psychological effects. Some cognitive abilities (e.g., mechanical or fluid intelligence and pragmatic or crystallized intelligence) decline with age while others, such as “wisdom or knowledge about the meaning and conduct of life” (Connell & Janevic, 2003), may increase with years of experience. Older adults report declines in both perceived and objective control (Bandura, 1997). Again, however, these declines are subject to other influences. On the one hand, increased physical illness and decreased capacities such as with balance may decrease self-efficacy. On the other hand, greater experience with self-management might increase efficacy for things like managing chronic diseases that often emerge in older adulthood. Across several psychological and cognitive dimensions, complex interweaving of changing capacities and factors associated with functioning underscores the importance of recognizing the dynamic interplay among influences in older adulthood (Connell & Janevic, 2003).

Complementing changes in the capacities of the older adult, changes in their social contexts influence psychological status and well-being. Widowhood, illness of spouses and partners, and death of friends may all reduce the support available and individuals with whom to share activities. A classic study (Lowenthal & Haven, 1968) documented the negative impacts on emotional status of level of social interaction. Older adults reporting low levels of social interaction were much more likely to report low levels of morale based on items assessing satisfaction with life, happiness, usefulness, positive mood, and planning, 85% of those low on social interaction versus 42% of those high on interaction (p. 24). Changes in social interaction, however, were substantially moderated by answers to a simple question regarding the availability of a confidant,

“Is there anyone in particular you confide in or talk to about yourself or your problems?” Among those whose level of social interaction had decreased, only 44% of those with a confidant reported low morale, but among those without a confidant, that percentage rose to 87% (p. 26). Similarly, among those who had been widowed in the previous 7 years, 45% of those with a confidant reported low morale, but 73% of those without a confidant reported low morale (p. 27). Again, dynamic interweaving of influences characterizes health and well-being among older adults.

Mental health problems are prominent among older adults. In the USA, the Centers for Disease Control and Prevention has estimated that “20% of people age 55 years or older experience some type of mental health concern” including “anxiety, severe cognitive impairment, and mood disorders (such as depression or bipolar disorder)” (Centers for Disease Control and Prevention & National Association of Chronic Disease Directors, 2008). Among these mental health burdens, older men have the highest rate of suicide, “45.23 per 100,000 compared to an overall rate of 11.01 per 100,000 for all ages” (Centers for Disease Control and Prevention & National Association of Chronic Disease Directors, 2008). Nevertheless, the vast majority of older adults do not report serious mental health problems. In national surveys in the USA, only 4.9% of those 65 years old or older reported current depressive symptoms (McGuire, Strine, Allen, et al., 2009) and only 2.7% reported “serious psychological distress,” assessed by frequency of feeling “nervous, hopeless, restless or fidgety, so depressed that nothing could cheer you up, that everything was an effort, or worthless” (McGuire, Strine, Vachirasudlekha, et al., 2009). The relationship between age and reported serious psychological distress is complex. In several countries, those 65 years and older report lower levels than those in middle age and younger adulthood (McGuire, Strine, Vachirasudlekha, et al., 2009) although one study reported the highest prevalence among those 80–84 years old (Clarke, Piterman, et al., 2008).

Ways in Which Psychological Problems Are Manifest in Common/Major Diseases

The manifestations of psychological problems and psychopathology in diseases are more varied and numerous than a single chapter can review in detail. Table 32.3 provides key examples of how psychological problems can be risk factors for, can complicate, and can result from physical disease.

Integration of Biological, Psychological, and Socioeconomic Influences

A central challenge is how we conceptualize the interaction of social, economic, psychological, developmental, and biological influences in health, well-being, and disease. Other chapters in this volume detail the social determinants of health (see Siddiqi et al., Sherlaw et al., *infra*), interactions of genetic and behavioral/environmental influences (see Nater, *infra*), as well as cultural influences (see Baumann, *infra*). Here we will focus on the question of how social and psychological influences “get under the skin” to influence biological processes, a question that is central to understanding the complexity of relationships between mental health and chronic disease (e.g., Uchino et al., *infra*, as well as Cohen, Tyrrell, & Smith, 1991; Uchino, 2006; Uchino, Bowen, et al., 2014).

As a model, we will focus here on the ways these processes may interact in diabetes and depression. Depression and stressful life events can lead to the activation of the hypothalamic-pituitary-adrenal (HPA) axis and complex hormonal interactions which might be involved in the pathogenesis of metabolic disorders. These complex hormonal interactions can give rise to a wide range of metabolic and cardiovascular abnormalities which characterize diabetes and are increasingly observed in people with depression, thus creating a vicious cycle of psychological and physical ill health (Axelrod & Reisine, 1984; Ma, Kong, et al., 2007).

Once diagnosed with diabetes or depression, treatment for one may affect the severity or progression of the other. Although requiring considerably more research, there have been reports of metabolic effects of medications used to treat psychological problems as well as reports of effects on mood and behavior of medications that have been used to treat diabetes mellitus and obesity (Boekholdt & Peters, 2010; Burch, McKenna, et al., 2009; Koval, Rames, & Christie, 1994; Lustman, Griffith, et al., 1997; Lustman, Williams, et al., 2007).

Starting with epigenetic effects of early maternal care (Meaney & Szyf, 2005; Strahler, Mueller-Alcazar, & Nater, 2014), there are a variety of ways in which social, psychological, and biological influences may interact in the etiology and course of both depression and diabetes, accelerating the psychological and metabolic abnormalities of each (Golden, Lazo, et al., 2008). As symptoms and complications of diabetes increase, associated psychosocial stress and reduced coping ability may contribute to depression. Additionally, the psychological burdens of diabetes treatments, such as insulin injection or blood glucose self-monitoring, can increase negative emotions and maladaptive behaviors and lead to a loss of interest, low energy, abnormal eating patterns, sleep disturbance, poor treatment compliance, and poor concentration. As diabetes may exacerbate depression, likewise evidence indicates deleterious effects of coexisting depression on clinical status, subsequent complications, mortality, and increased healthcare expenditures (Black, Markides, & Ray, 2003; de Groot, Anderson, et al., 2001; Katon, Rutter, et al., 2005).

What Are We Preventing, Treating, and Managing? Key Definitional and Conceptual Issues

In order to develop comprehensive approaches to the effective prevention and/or management of psychological and physical health, it is necessary to clarify just how the problems and their interrelationships are to be approached. The term

Table 32.3 Manifestation of psychological concerns in common diseases**Linkage 1 – Psychological concerns are risk factors for physical disease***Cancer*

- Depression influences immune activation and inflammation, which is associated with increased cancer risk (Currier & Nemeroff, 2014)
- Major depressive disorder is associated with accelerated biological aging, measured by shortened telomere length (Verhoeven, Revesz, et al., 2014)

Cardiovascular disease

- Depression independently elevates risk for various forms of cardiovascular disease (Van der Kooy, van Hout, et al., 2007)
- Major depressive disorder and bipolar disorder are recognized as risk factors for advanced atherosclerosis and early cardiovascular disease in pediatric patients (Goldstein, Carnethon, et al., 2015)
- Women diagnosed with schizophrenia are at a higher risk of acute myocardial infarction (Wu, Chen, et al., 2015)
- Ethnic minorities with severe mental illness are at an elevated risk for cardiovascular disease (Carliner, Collins, et al., 2014)

Chronic Obstructive Pulmonary Disease (Bronchitis, Emphysema)

- Nicotine dependence is a major risk factor for COPD, such that among smokers, the shorter the time to first cigarette after waking, the greater the COPD risk (Guertin, Gu, et al., 2015)
- In Taiwan, COPD is more prevalent in individuals with schizophrenia than the general population (Hsu, Chien, et al., 2013)

Diabetes

- In a meta-analysis of 23 longitudinal studies, depression was highlighted as a major risk factor for incident type 2 diabetes (Rotella & Mannucci, 2013a)
- Individuals reporting high levels of psychological distress were 33% more likely to develop type 2 diabetes than individuals reporting low levels of distress (Mommersteeg, Herr, et al., 2012)

HIV/AIDS

- Among Medicaid beneficiaries, individuals with a substance use disorder were 3.1 times more likely to receive an HIV diagnosis than individuals without a substance use disorder (Prince, Walkup, et al., 2012)
- Among cocaine users, severe psychological distress increases needle sharing behavior, a major risk factor for HIV infection (Lévesque, Bruneau, et al., 2014)

Maternal and child health

- Compared to women without a history of mental illness, mothers with bipolar disorder are more likely to have adverse pregnancy outcomes, specifically, low birth weight, small for gestational age, and preterm birth (Lee & Lin, 2010)
- Children of mothers with comorbid mental disorders are at a higher risk for internalizing disorders (Hser, Lanza, et al., 2015)

Linkage 2 – Psychological concerns complicate physical disease*Cancer*

- Depression is related to higher mortality rates among cancer patients (Pinquart & Duberstein, 2010)
- Individuals with mental illness are less likely to undergo routine cancer screenings (Aggarwal, Pandurangi, & Smith, 2013) and more likely to have metastases at diagnosis (Kisely, Crowe, & Lawrence, 2013)

Cardiovascular disease

- Neuroticism is associated with poorer quality of life in patients with chronic heart failure (Samartzis, Dimopoulos, et al., 2014)
- Individuals with coronary heart disease that also have severe anxiety are more likely to experience cardiovascular events than individuals without anxiety symptoms (Martens, de Jonge, et al., 2010; Moser, 2011)
- Among patients with acute coronary syndrome, depression is recognized as a major risk factor for poor medical outcomes (Lichtman, Froelicher, et al., 2014)

(continued)

Table 32.3 (continued)

<i>Chronic Obstructive Pulmonary Disease (Bronchitis, Emphysema)</i>
<ul style="list-style-type: none"> • Anxiety and depression are known to exacerbate symptoms in COPD (Abrams, Vaughan-Sarrazin, & Vander Weg, 2011; Laurin, Moullec, et al., 2012) • COPD patients with anxiety tend to have poorer outcomes than those without anxiety; specifically, they have greater difficulty with exercise and report more functional limitations (Eisner, Blanc, et al., 2010)
<i>Diabetes</i>
<ul style="list-style-type: none"> • Persons with diabetes and severe mental illness are significantly more likely to require re-hospitalization within a month after discharge (Lydia A. Chwastiak, 2014) • Individuals with substance abuse disorders are less likely to adhere to a type 2 diabetes medication regimen (Kreyenbuhl, Dixon, et al., 2010)
<i>HIV/AIDS</i>
<ul style="list-style-type: none"> • Depressed individuals with HIV have worse outcomes than nondepressed individuals with HIV, with reduced treatment adherence and quality of life (Nanni, 2015) • HIV patients with major depressive disorder and psychiatric comorbidity have particular poor outcomes (Gaynes, 2015) • Depression is thought to increase HIV disease progression to AIDS (Schuster, Bornovalova, & Hunt, 2012)
<i>Maternal and child health</i>
<ul style="list-style-type: none"> • Mothers who use antidepressants while pregnant are more likely to have preterm births (Einarson, Choi, et al., 2010) and preeclampsia (Palmsten, Setoguchi, et al., 2012)
Linkage 3 – Psychological concerns result from physical disease
<i>Cancer</i>
<ul style="list-style-type: none"> • Many cancer patients suffer from psychological distress after receiving a diagnosis, and a recent meta-analysis suggests that prevalence rates of clinical depression range from 8 to 24% amongst adult cancer patients (Krebber, Buffart, et al., 2014) • After receiving a cancer diagnosis, adolescents and young adults are at a significantly elevated risk for suicidal behavior (Lu, Fall, et al., 2013)
<i>Cardiovascular disease</i>
<ul style="list-style-type: none"> • Myocardial infarctions have been shown to be causal factors of both depression (Meijer, Conradi, et al., 2011) and PTSD (Edmondson & Cohen, 2013; Guler, Schmid, et al., 2009)
<i>Chronic Obstructive Pulmonary Disease (Bronchitis, Emphysema)</i>
<ul style="list-style-type: none"> • Exacerbations in COPD symptoms lead to a subsequent rise in symptoms of PTSD (Teixeira, Porto, et al., 2015) • Likewise, patients with COPD have an elevated risk for anxiety (Eisner, Blanc, et al., 2010) • COPD confers elevated risk of suicide after controlling for psychological status and history. Risk increases with stage of COPD progression (Chung, Han, et al., 2014; Strid, Christiansen, et al., 2014)
<i>Diabetes</i>
<ul style="list-style-type: none"> • Patients diagnosed with diabetes mellitus are at a significantly elevated risk to develop depressive symptoms (Rotella & Mannucci, 2013b), severe psychological distress (Shin, Chiu, et al., 2013), and anxiety disorders (Smith, Béland, et al., 2013) • In addition to its relationships with depression and quality of life, diabetes and the burdens and stressors it entails may cause diabetes distress that may also complicate management of the disease (Fisher, Gonzalez, & Polonsky, 2014)
<i>HIV/AIDS</i>
<ul style="list-style-type: none"> • HIV infection is correlated with a substantially higher risk for major depressive disorder (Bhatia, Hartman, et al., 2011; Ciesla & Roberts, 2001) • HIV patients may experience emotional distress and suicidal ideation (Kalichman, Heckman, et al., 2000)
<i>Maternal and child health</i>
<ul style="list-style-type: none"> • Medical difficulties during pregnancy and delivery are associated with a greater risk for maternal postpartum depression (Blom, Jansen, et al., 2010) • Both infant complications and obstetric emergencies are associated with the development of PTSD symptoms in mothers (Andersen, Melvaer, et al., 2012)

“comorbidity” connotes two well-defined and distinct clinical entities, occurring simultaneously and each tending to occur more frequently in the presence of the other. Viewing comorbid conditions as distinct entities, however, may not capture important relationships and interactions between them. Here we review conceptual approaches to relationships between or among co-occurring conditions, again taking diabetes and depression as a model.

A Dimensional Versus Categorical View of Each of Diabetes and Depression Both depression and diabetes are commonly defined categorically with specific criteria used to classify individuals as having either depression or diabetes. Within each of depression and diabetes, subcategories are increasingly refined based on emerging insights from genomics and phenotyping. These confirm the heterogeneity of the broader categories.

An alternative to categorical definition of depression has been a dimensional characterization of mood or dysphoria, often using standardized instruments such as the popular Beck Depression Inventory which was originally developed and validated as a measure of depressed mood, not of categorical depression (Beck, Ward, et al., 1961; Roy, Lloyd, et al., 2011). As an example of the dimensional perspective in diabetes, the success of preventing incident diabetes in high-risk subjects has led to the identification of a dimension of dysglycemia including varying degrees of insulin resistance and deficiency that underlie manifest abnormalities in glucose metabolism. Supporting the dimensional perspective, “graded relationships” between depression and both myocardial infarction and all-cause mortality suggest that depression “is best viewed as a continuous variable that represents a chronic psychological characteristic rather than a discrete and episodic psychiatric condition” (Barefoot & Schroll, 1996).

With each of depression and diabetes, categorical definitions may be superimposed on the dimensional by defining the diagnostic category according to a convention of some criterion score as in common definitions of hypertension.

Single Problem Versus Group of Problems In addition to the difference between viewing problems as distinct categories and viewing them as dimensions, diabetes and depression may each be categorized as part of a broader class of problems, cardiometabolic abnormalities for diabetes and negative emotions for depression. For example, studies of depression in various groups, such as patients with cancer (Brown & Kroenke, 2009) or asthma (Lavoie, Bacon, et al., 2006), indicate high co-occurrence of depression, anxiety, and other varieties of psychological distress (Hjerl, Andersen, et al., 2002). Similarly, studies in cardiovascular risk indicate the utility of grouping together a set of negative emotions that includes depression, anxiety, hostility, and stress (Williams, Barefoot, & Schneiderman, 2003) for understanding their complex interactions in pathways related to cardiovascular pathogenesis (Brummett, Boyle, et al., 2010). Recent work in diabetes, too, indicates that diabetes distress may be more closely related to metabolic control than measures of depressed mood alone (Fisher, Mullan, et al., 2010). Parallel to the overlap among measures of psychological disorder and distress, hyperlipidemia, central adiposity, and hypertension often co-occur with “prediabetes” or diabetes, leading some to refer to the group as comprising a “metabolic syndrome” (Eckel, Grundy, & Zimmet, 2005).

Whether depression and diabetes are best viewed as distinct or as members of broader categories is controversial. For example, some argue that, however much they may co-occur, one needs to treat the individual cardiovascular and metabolic problems encompassed by the term “metabolic syndrome” with appropriate medications for each of diabetes, hypertension, and hyperlipidemia (Kahn, 2008). Similarly, one may argue that beyond the co-occurrence with anxiety, hostility, and stress, depressed mood alone has a specific and distinctive role with each of diabetes and cardiovascular disease requiring specific treatment rather than a more generalized approach.

Viewing diabetes or depression as distinct entities or as parts of broader syndromes may depend on the lens through which the problems are

viewed. For example, Valderas and colleagues (Valderas, Starfield, et al., 2009) noted that the value of different models of comorbidity would vary according to the perspective taken by specialist, primary care, public health, or health services. From the perspective of clinical care of individuals, differentiating among specific problems, depression, anxiety, and hostility on the one hand and diabetes, hypertension, and hyperlipidemia on the other may make great sense. Whether with psychotherapy or psychopharmacology, management of depressed mood generally differs from treatment of hostility or anxiety, just as medication for diabetes differs from that for hypertension or hypercholesterolemia. At the population level, however, co-prevalent problems may share common treatment and prevention targets, such as healthy diet, physical activity, and weight management for diabetes and cardiovascular disease, or, for negative emotions, socioeconomic well-being and communities and families that encourage cooperation and satisfying relationships among neighbors. Thus the broader categories of cardiometabolic abnormalities and negative emotions may help guide population-wide prevention and treatment campaigns. At the same time, the individual components of these broad categories are duly the focus of clinical intervention.

Heterogeneity of Depression and Distress Depression is often discussed as a unitary “thing,” when in fact it is quite heterogeneous. A study among Dutch adults examined differences in severity and symptom patterns to identify three subtypes of depression: (1) moderately severe, (2) severe melancholic, and (3) atypical that is “characterized by increased appetite, weight gain, leaden paralysis (e.g., leaden, heavy arms and legs), and to a lesser extent hypersomnia and is associated with female sex, being overweight, and the metabolic syndrome” (Snoek, Bremmer, & Hermanns, 2015). This latter, atypical type may be especially related to diabetes.

In addition to heterogeneity among types of depression, Snoek and his colleagues (Snoek, Bremmer, & Hermanns, 2015) point out varied connections between depression and diabetes distress. Separate from generally depressed mood,

diabetes distress is focused on the stressors and demands of diabetes and its management and emotional responses to these. Items from a popular measure of diabetes distress include, e.g., “Feeling overwhelmed with the demands of living with diabetes,” “Feeling that I am often failing with my diabetes routine,” “Not feeling motivated to keep up my diabetes self-management,” and “Feeling angry, scared, and/or depressed when I think about living with diabetes” (Fisher, Glasgow, et al., 2008). Depression and diabetes distress are related, but not as closely as one might think. L. Fisher and colleagues, for example, have argued that, because it is more closely related to diabetes management and problems with it, distress is more predictive of glycemic control than depression (Fisher, Mullan, et al., 2010).

Snoek and colleagues outline a model of the four combinations of the presence/absence of each of distress and depression and possible treatment strategies for each. Those who are distressed by their diabetes but not depressed, for example, might benefit from “psychoeducation or supportive counseling to help improve their problem solving skills and coping with the daily demands of diabetes self-care” (Snoek, Bremmer, & Hermanns, 2015). This might best be delivered in close coordination or as part of their diabetes care. On the other hand, those who are both depressed and distressed are perhaps “most psychologically vulnerable ... [among whom] the interaction between mood and diabetes-related issues deserves special attention ... [so that patients] are likely to benefit most from diabetes-specific depression treatment” (Snoek, Bremmer, & Hermanns, 2015).

Separate “Comorbidities” or Depression and Distress as Part of Normal Clinical Picture of Diabetes Snoek and his colleagues conclude their review of depression and distress by arguing for the inclusion of both within our broader understanding of diabetes; “both ... deserve to be assessed routinely” among both adults and children with diabetes (Snoek, Bremmer, & Hermanns, 2015). Consider foot ulcers, routinely viewed as an important part of diabetes deserving special attention because of their importance in the devel-

opment of lower extremity complications and potential for amputations. A 2008 study among older adults with diabetes found an 8% yearly prevalence of foot ulcers (Margolis, Malay, et al., 2011). In contrast, depression affects 10–20% of those with diabetes (Roy & Lloyd, 2012).

Viewing diabetes and depression as part of broader groupings or syndromes may also make sense *across* the categories of mental health and medical illness. Research such as from the Diabetes Prevention Program (Rubin, Knowler, et al., 2005; Rubin, Ma, et al., 2008) raises the possibility that depression is an early sign or precursor of diabetes. Thus, as we think of the comorbidity of diabetes and depression, we might consider whether they are best viewed as distinct clinical entities that occasionally exist together or as components of a broader syndrome encompassing both psychological and physical problems. More generally, the term, “depression” needs to be understood as referring to mood changes that may be combined with a large – probably larger than currently recognized – number of problems and syndromes, rather than as a single entity.

In an integrated approach, the treatment of depression becomes a routine part of diabetes care, just as foot care and yearly retinal checks.

So, too, the psychological or medical treatment of depression may be expanded to address its routine metabolic and cardiovascular dimensions. Consider physical activity, often included in diabetes self-management and increasingly recognized as helpful in reducing depression (Penedo & Dahn, 2005; Teychenne, Ball, & Salmon, 2008). When promoting physical activity in diabetes self-management, one should routinely consider reticence to engage in exercise as potentially linked to mood problems. Additionally, one should structure goal setting and monitoring to maximize the possible benefits not only of physical activity itself but also of the mood-elevating effects of achieving a personal goal (Piette, Richardson, et al., 2011). At the same time, promoting physical activity as part of depression treatment may draw added emphasis from the recognition of its value not only in increasing mood but also in reducing cardiovascular risks to which those with depression are prone.

Biosocial Propensity to Chronic Disease and Psychological Distress Bringing together a number of the points developed in this volume, Fig. 32.1 outlines a biosocial complex of determinants of disease, ranging from genetic and epigenetic effects including those of maternal

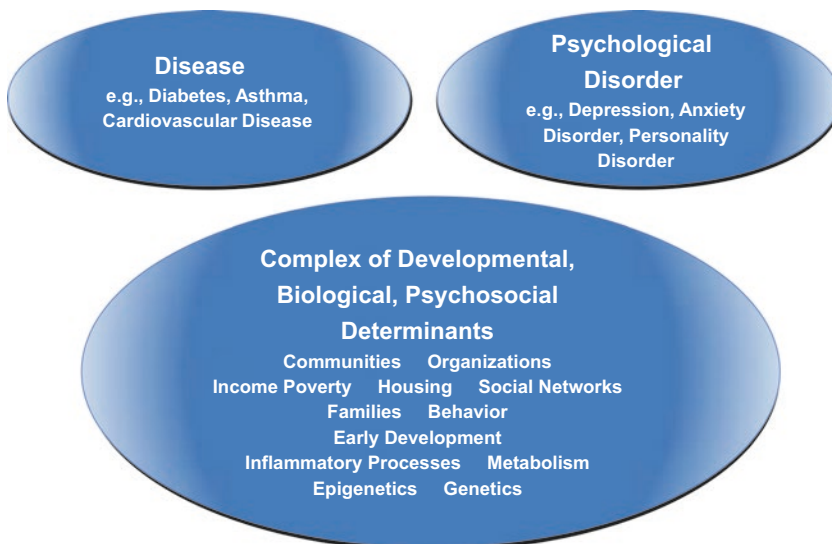


Fig. 32.1 Biosocial complex of determinants of disease and psychological disorder

nurturance during early childhood, to community design. Given sufficient deficiencies in this complex, some kind of disease, whether diabetes, asthma, or others, is very likely as is some variety of appreciable psychological distress or psychopathology. The particular expression of this bio-social complex in one or another disease and one or another type of psychological problem may be hard to predict, but the likelihood of at least one of each – disease and psychological distress – is great. In casual survey of practicing primary care clinicians, the common response is “That’s half of my waiting room.”

Figure 32.1 raises an important point, “What is fundamental that requires attention?” The fundamental appears to be the biosocial complex of events that makes expression in diabetes and depression or some other varieties of medical and psychological morbidity highly likely. The particular choice of expressions may be almost accidental or perhaps guided by some specific factors such as a particular genotype or type of aggravating experience such as in exposure to trauma and PTSD, but the likelihood of such expressions is almost assured.

Interventions

Peer Support

Among strategies for integrating clinical and preventive, individual and population approaches to treatment of psychological disorders and chronic diseases, peer support (e.g., “community health workers,” “lay health advisors,” “*Promotores*”) may deserve special attention. Peer supporters can assist individuals in adopting and provide encouragement to help sustain the behaviors that comprise psychological and chronic disease management (Fisher, Boothroyd, et al., 2012). They may also provide emotional support and encourage problem-solving to address depression and other emotional distress (Rahman, Malik, et al., 2008). From the perspective of reaching populations, peer supporters can also engage and benefit those who otherwise fail to receive appropriate care (Fisher, Ballesteros, et al., 2015;

Fisher, Strunk, et al., 2009; Sokol & Fisher, 2016). All of these can assist in identifying and recruiting into treatment those with psychological disorders and chronic diseases and in helping them take full advantage of resources available.

Both the social isolation or lack of a confidant that often accompany psychopathology and distress (Fisher, Chan, et al., 2012; Lowenthal & Haven, 1968) and the importance of simple social contact and emotional support (Harlow, 1958) suggest that simple, frequent, affirming, and pleasant contact from a supporter may be especially helpful to those with emotional distress.

“Lady Health Workers” and Peer Support in Maternal and Child Health In a striking cluster randomized evaluation in Pakistan, “Lady Health Workers” implemented a cognitive-behavioral, problem-solving intervention (Rahman, 2007) for women who met criteria for major depression during the third trimester of their pregnancies. Relative to controls, the intervention substantially reduced depression 12 months postpartum (OR = 0.23, $p < 0.0001$) (Rahman, Malik, et al., 2008). In India, peer support for depression, anxiety, and other mental health problems included education about psychological problems and ways of coping with them (e.g., deep breathing for anxiety symptoms) as well as interpersonal therapy (de Mello, de Jesus Mari, et al., 2005), all delivered by lay health counselors with backup by primary care and monthly consultations from psychiatrists. Results included a 30% decrease in prevalence of depression and other common mental disorders among those meeting criteria at baseline, 36% reduction in suicide attempts or plans, as well as reductions in days out of work (Patel, Weiss, et al., 2011).

Research with the Lady Health Workers has also considered the roles of socioeconomic determinants in the development of chronic diseases and psychological disorders. If a program reduces the effect of low-income status on some important outcome, for example, then it would be reducing disparity related to low income. In Pakistan, the Lady Health Workers intervention for postpartum depression eliminated the impact of factors such as lack of financial empowerment which, in the absence of intervention, sharply dif-

ferentiated those becoming depressed (Rahman, Sikander, et al., 2012).

An important consideration among concerns for more effective and affordable care is the relationship between psychological disorders and frequency of hospitalizations among those with chronic diseases. Evidence indicates peer support may have a useful role in this regard. In a randomized study among adults with diabetes in Hong Kong, all received JADE (Chan, So, et al., 2009), a standardized, systematic model of care incorporating quarterly reports to patients providing appraisal of clinical status and self-management recommendations. In addition to JADE, half of the participants were randomized to receive PEARL, telephone-based peer support provided by trained peer supporters. Reflecting patterns familiar to those working in health policy and services, the 20% of patients with elevated levels of depression, anxiety, and/or stress were more likely to be hospitalized (34%) than those without distress (20%). Among this group with heightened distress, the PEARL peer support intervention improved distress scores relative to JADE alone ($p = 0.03$) and reduced overall hospitalizations (relative risk = 0.15, $p < 0.001$), a reduction to the “normal” level of those low on distress measures (Chan, Sui, et al., 2014). That is, among the fifth of patients with the highest scores on distress and who account for greatly disproportionate hospital care, the addition of peer support to standardized, high-quality clinical care substantially reduced distress and lowered associated hospitalization rates to normal levels.

An important impact of psychological distress in chronic disease is its role in complicating efforts to reach and engage patients in recommended care. Peer support may be an especially effective strategy for reaching those who are too often “hardly reached” (Sokol & Fisher, 2016). Asthma coaches pursuing a nondirective, flexible, stage-based approach were able to engage 89.7% of mothers of Medicaid-covered children hospitalized for asthma. The coaches sustained that engagement, averaging 21.1 contacts per parent over a 2-year intervention. Of those randomized to the asthma coach, 36.5% were re-

hospitalized over the 2 years, relative to 59.1% randomized to usual care ($p < 0.01$) (Fisher, Strunk, et al., 2009).

Other examples illustrate the ability of peer support to reach those too often hardly reached. In a successful peer support intervention for diabetes management among patients of safety net clinics in San Francisco (Thom, Ghorob, et al., 2013), participants were categorized as low, medium, or high medication adherence at baseline. The peer support led to greater reductions in HbA1c than in controls across all groups, but the differential impact of peer support was greatest among those initially in the low adherence group (Moskowitz, Thom, et al., 2013). In a peer support intervention among veterans with diabetes (Heisler, Vijan, et al., 2010), improvements in blood glucose measures were substantially more pronounced among those with low initial levels of diabetes support (p for interaction < 0.001) and those with low health literacy (p for interaction < 0.05) (Piette, Resnicow, et al., 2013). A systematic review of peer support interventions for hardly reached groups found that 94% reported significant benefits favoring peer support relative to control conditions (Sokol & Fisher, 2016).

Stress Management, Cancer, and HIV

Chronically ill individuals, particularly those with diseases perceived as potentially life-threatening and stigmatizing, such as HIV and cancer, face substantial stressors. These stressors occur as part of people’s experiences adjusting to a diagnosis as well as living with and managing a serious, chronic disease. Disease management stressors commonly include undergoing treatments and experiencing side effects, facing one’s mortality, feeling stigmatized or isolated from others, and experiencing illness episodes, pain, disability, and strained relationships (Antoni, Lutgendorf, et al., 2006; Brown & Vanable, 2008; Grassi, Caruso, & Costantini, 2015; Scott-Sheldon, Kalichman, et al., 2008). Often individuals with chronic diseases are also exposed to serious life stressors due to psychosocial factors, such as poverty, substance abuse, psychological distress,

and childhood trauma (Brown & Venable, 2008; Scott-Sheldon, Kalichman, et al., 2008).

For diseases like HIV and cancer that are immune mediated, not only is stress more prevalent, but researchers have also found that greater stress, anxiety, and depression, as well as limited skills for coping with these, prospectively worsen disease progression (Antoni, Lutgendorf, et al., 2006; Artherholt & Fann, 2012; Atkinson, Schönnesson, et al., 2008; Balbin, Ironson, & Solomon, 1999; Kalichman, Heckman, et al., 2000; Leserman, 2008). These findings are due, at least partly, to mediating psychoneuroimmunologic effects of stress on disease, through stimulation of the autonomic sympathetic nervous system and the hypothalamic-pituitary-adrenocortical axis, which in turn interact with the immune system (Antoni, 2003; Antoni, Lutgendorf, et al., 2006; Artherholt & Fann, 2012; Balbin, Ironson, & Solomon, 1999; Leserman, 2003, 2008; McGregor, Antoni, et al., 2004; Segerstrom & Miller, 2004). With HIV, for example, psychological distress has been associated with increases in disease progression, including lower CD4 immune cell counts, fewer natural killer cells, and elevated levels of virus in patients' blood (Ironson, Balbin, et al., 2005; Leserman, 2008). Similarly, growing evidence demonstrates that stress and stress-related behavioral factors may contribute to cancer growth and metastasis through their effect on both the hypothalamic-pituitary-adrenocortical axis and the sympathetic nervous system, resulting in the release of glucocorticoids, catecholamines, and other factors that directly or indirectly influence malignancy (Artherholt & Fann, 2012). Affected pathways include the cellular immune response, inflammation, tumor angiogenesis, and tumor cell signaling pathways. Stress is also believed to influence physiological health because it can interfere with individuals' abilities to adhere to medical recommendations (Brown & Venable, 2008).

In response to evidence that stress is both elevated and worsens the health of HIV and cancer patients, researchers over the last two decades have focused on designing and testing interventions to help patients enhance their capacity to

cope with and reduce stressful experiences. These interventions aim to improve both psychological and physiological health outcomes.

The theoretical conceptualization of stress and its effects on clinical outcomes in the setting of chronic illness is based primarily on Lazarus and Folkman's Transactional Model of Stress and Coping (Lazarus & Folkman, 1984, 1987), which builds from Lazarus' book *Psychological Stress and the Coping Process* (Lazarus, 1966). The Transactional Model of Stress and Coping emphasizes the role of cognitive appraisal and the processes ordinary people use to deal with everyday distress. It also emphasizes the relationship between the nature of the stressor and the capacities and skills of the individual. As Lazarus and Folkman defined it in their classic work, *Stress, Appraisal and Coping*, "Psychological stress is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). Simply put, stress occurs as a result of the imbalance between demands and resources. *Coping*, then, is composed of the behaviors and thoughts individuals use to manage the internal and external demands of stressful circumstances. In an effort to capture the complex multidimensional processes humans use to address threats, coping styles are typically categorized as "problem focused" (directly addressing the stressor), "emotion focused" (deregulating negative and enhancing positive emotions), or "appraisal focused" (changing the way one thinks about the stressor) (Folkman & Moskowitz, 2004). Stress management interventions have used this framework to reduce the stress of individuals facing chronic illness by enhancing their coping resources. Researchers at the University of Miami were among the first to design manualized, multi-session, cognitive-behavioral group programs, known as cognitive behavioral stress management (CBSM), to help HIV-infected and cancer patients manage stress (Antoni, 2003; Antoni, Lehman, et al., 2001).

Specifically for patients with HIV, there is now a substantial body of evidence that CBSM and similar approaches offer a promising adjunct

to HIV management. For example, two systematic reviews (Brown & Venable, 2008; Harding, Liu, et al., 2011) and a meta-analysis (Scott-Sheldon, Kalichman, et al., 2008) found generally positive effects of stress-management or coping interventions on physical and psychological health outcomes among people living with HIV. Two additional reviews examined studies of cognitive behavioral interventions to reduce anxiety in people with HIV (Clucas, Sibley, et al., 2011) and comparing the effect of CBSM on outcomes of HIV-infected patients with a history of trauma or post-traumatic stress disorder (PTSD) (Seedat, 2012), respectively.

In Brown and Venable's (2008) review of 21 randomized, controlled trials of CBSM interventions, all of the interventions utilized cognitive and behavioral stress management strategies designed to facilitate adaptive coping and to decrease the negative impact of stress. Moreover, these interventions highlighted the value of active, problem-focused coping strategies as well as cognitive restructuring, or modifying one's stress appraisal process to match a new coping ability. Emotional regulation strategies and decreasing psychological distress were also often identified as objectives. Three quarters of the interventions included relaxation training and most encouraged strategies to enhance the use of social support networks. Interventions varied in number, length, and timing. All but one of the interventions used a group-based intervention approach. Most used multiple sessions (range 6–20; mode = 10) with a duration of 1–2.5 h (mode = 2). Overall, most studies that assessed the outcome found many improvements in perceived stress, depression, anxiety, global psychological functioning, social support, and quality of life. Effects on the coping and immune function markers, however, were mixed. One study that looked at stress hormone levels found stress effects on norepinephrine and testosterone but not on epinephrine or cortisol levels (Antoni, Cruess, et al., 2000; Cruess, Antoni, et al., 2000). Other assessments found greater naive T cells (Antoni, Cruess, et al., 2002) and higher cytotoxic T cells (Antoni, Cruess, et al., 2000), both cells that facilitate the

function of the immune system, respectively, in the intervention groups at follow-up. No studies, however, found any effect on CD4 cell count, which would indicate improved health. Furthermore, most studies did not control for other important factors and most had only brief follow-up periods. Scott-Sheldon et al.'s (2008) meta-analysis of 46 stress management interventions in 35 randomized controlled trials drew similar conclusions (Scott-Sheldon, Kalichman, et al., 2008).

In Harding et al.'s (2011) systematic review of 28 interventions aimed at improving HIV coping strategies, 21 involved psychological interventions (as opposed to others that used medications, diet and exercise, and informational or spiritual approaches), most of which were CBSM (Harding, Liu, et al., 2011). Harding specifically evaluated intervention effects on coping skills. Of all 28 studies, 17 (60%) had a positive effect on coping skills; those that used CBSM, however, were noted to be most promising although comparison across studies was limited by heterogeneity in the measures of coping. Similarly, the reviews of studies specific to HIV-infected patients with anxiety and trauma/PTSD concluded that CBSM was generally most effective at improving psychological distress (Clucas, Sibley, et al., 2011; Seedat, 2012).

All five of the reviews cited above noted the promising nature of CBSM for improving health outcomes in HIV; yet they pointed out the need for further understanding of the mechanism by which the interventions acted and that most studies they had reviewed had been conducted in gay and bisexual white men and called for more targeted interventions of diverse populations. Yet one study, the Stress Management and Relaxation Training/Expressive Supportive Therapy (SMART/EST) Women's Project, was designed specifically to address the unique experiences of minority women living with HIV (Jones, Owens, et al., 2010). While the intervention was generally ineffective, those in the intervention group who increased their self-efficacy also had reduced depression and anxiety. These findings suggest that additional adaptation of CBSM interventions may be required to more fully enhance the cogni-

tive behavioral self-efficacy of women to better address their psychological distress.

More recently, investigators at the University of Miami, as well as others, have sought to adapt and test their 10-week CBSM group intervention for cancer patients, particularly those with prostate cancer (Parker, Pettaway, et al., 2009; Penedo, Dahn, et al., 2004; Penedo, Molton, et al., 2006; Penedo, Traeger, et al., 2007; Traeger, Penedo, et al., 2013) and early stage breast cancer (Carpenter, Stoner, et al., 2014; Groarke, Curtis, & Kerin, 2013; Lechner, Whitehead, et al., 2014; McGregor, Antoni, et al., 2004; Nápoles, Ortíz, et al., 2015; Stagl, Antoni, et al., 2015). Although, to date, no systematic reviews of these trials have been conducted, review of the studies indicate more diverse study sample than those seen in many of the HIV trials.

Among an ethnically diverse group of men who had undergone treatment for localized prostate cancer, CBSM increased men's finding benefits of their cancer experience (Penedo, Molton, et al., 2006), emotional well-being (Traeger, Penedo, et al., 2013), and overall quality of life (which was mediated by stress management skills) (Penedo, Dahn, et al., 2004; Penedo, Molton, et al., 2006), but not in their illness perceptions (Traeger, Penedo, et al., 2013). Women with early stage breast cancer undergoing an adaptation of the same 10-session group CBSM not only increased their "benefit finding," but this increase also mediated their improved immune function 3 months later (McGregor, Antoni, et al., 2004). The intervention also improved sleep quality and reduced fatigue (Vargas, Antoni, et al., 2014) and impressively led to fewer depressive symptoms 5 years after the intervention (Stagl, Antoni, et al., 2015) and better all-cause mortality at 11 years follow-up (Stagl, Antoni, et al., 2015). In another study of the same intervention among underserved African American breast cancer survivors, however, both arms showed significant improvements in mood and perceived stress with no differences between groups (Lechner, Whitehead, et al., 2014). Among monolingual Hispanic men, in addition to overall well-being, physical, emotional, and sexual well-being (often affected by the impact

of prostate cancer treatment on urinary and sexual function) were all shown to improve significantly more in the CBSM group (Penedo, Traeger, et al., 2007).

Some studies have assessed whether less intensive CBSM interventions could be effective. One study assessing an individually and presurgically delivered and shorter (two sessions plus two booster sessions) cognitive behavioral stress management program for prostate cancer patients showed immediate benefit on mood and improved physical (but not mental health) quality of life 1 year after surgery (Parker, Pettaway, et al., 2009) suggesting the shorter approach may be a useful adjunct to standard care when longer group sessions are not feasible. Similarly, Groarke et al. (2013) found that a five-session CBSM with breast cancer patients reduced global stress and anxiety while improving benefit-finding, but the effects were also not sustained after a year. Of note, women with greater global stress at baseline responded more to the intervention. More recently, researchers have begun to assess the effectiveness of an online CBSM for breast cancer as an alternative means to facilitate dissemination (Carpenter, Stoner, et al., 2014).

Mindfulness-Based Therapy

Mindfulness meditation has gained popularity as a stress-reduction technique that appears to support general health and well-being (Goyal, Singh, et al., 2014). Mindfulness-based programs are now offered all over the world, in hospitals, schools, workplaces, prisons, and health centers (Kabat-Zinn, 2003). Mindfulness has also been incorporated into a variety of health interventions (Mars & Abbey, 2010). Jon Kabat-Zinn, a leader in introducing mindfulness to Western psychology (Baer, 2003), describes the practice as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003), p. 145). Mindfulness can be developed through meditation, specifically through the practice of focusing

one's attention on thoughts, bodily sensations, and external stimuli, without evaluation or judgment (Baer, 2003).

Mindfulness-based therapy includes several therapeutic approaches that incorporate mindfulness practice (Piet, Wurtzen, & Zachariae, 2012), most notably mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990). MBSR is an 8-week, group-based program that incorporates formal in-person mindfulness meditation practice with homework assignments for individuals to practice mindfulness throughout the week (Vøllestad, Nielsen, & Nielsen, 2012). MBSR has been shown to be effective in reducing stress and psychological symptoms, improving coping strategies, and enhancing quality of life in both clinical and nonclinical populations (Grossman, Niemann, et al., 2004; Vøllestad, Nielsen, & Nielsen, 2012). A meta-analysis of eight randomized controlled studies highlighted the positive impact of MBSR on the mental health of individuals suffering from chronic diseases, with effect sizes of 0.26, 0.24, and 0.32 on depression, anxiety, and psychological distress, respectively (Bohlmeijer, Prenger, et al., 2010).

Among its positive psychological impacts, mindfulness increases self-efficacy and emotional processing (Grossman, Niemann, et al., 2004) and decreases symptoms of anxiety and depression (Goyal, Singh, et al., 2014; Khoury, Lecomte, et al., 2013; Vøllestad, Nielsen, & Nielsen, 2012). In one randomized controlled trial, individuals in a mindfulness meditation group had greater activation of the left-anterior hemisphere of the brain, which is associated with positive emotions, than a wait-list control group when brain electrical activity was measured (Davidson, Kabat-Zinn, et al., 2003). Carmody and Baer (2008) found that greater time spent practicing mindfulness meditation is associated with increases in various aspects of trait mindfulness, which mediates the relationship between mindfulness meditation practice and psychological well-being (Carmody & Baer, 2008). In another randomized controlled trial of undergraduates ($N = 82$), a mindfulness meditation intervention decreased negative mood, depressive symptoms, fatigue, confusion, and heart rate

in comparison to control groups (Zeidan, Johnson, et al., 2010).

Mindfulness has been shown to support general health and well-being in a variety of health interventions (Mars & Abbey, 2010). Recent work indicates that mindfulness can promote healthy eating habits and decrease psychological distress in individuals with binge eating disorder (Dalen, Smith, et al., 2010; Katterman, Kleinman, et al., 2014), improve quality of life in multiple sclerosis patients (Schirda, Nicholas, & Prakash, 2015), and enhance social skills in autistic adolescents (de Bruin, Blom, et al., 2015). Davidson, Kabat-Zinn, et al. (2003) showed that mindfulness improved immune function. In their randomized controlled trial, subjects in both mindfulness meditation and control groups were given a flu shot immediately after the intervention ended. The mindfulness group had significantly greater increases in antibody titers in response to the flu vaccine than the control group ($t = 2.05, p < 0.05$).

Mindfulness also appears to help individuals with diabetes. In one randomized controlled trial, participants either participated in a diabetes education program that involved a version of mindfulness training called "Acceptance and Commitment Therapy" (Hayes, Strosahl, & Wilson, 2012) or an education-only program (Gregg, Callaghan, et al., 2007). After 3 months, patients in the Acceptance and Commitment Therapy group had enhanced coping strategies, better diabetes self-management, and were more likely to have glycated hemoglobin (HbA1C) in their target range. Other works support these findings and suggest that increased mindfulness can result in better glycemic control, reduced mean arterial pressure, and fewer depressive symptoms among those with diabetes (Hartmann, Kopf, et al., 2012; Rosenzweig, Reibel, et al., 2007; Tovote, Fleer, et al., 2014).

Cardiovascular health may also be improved by mindfulness. Loucks, Schuman-Olivier, et al. (2015) review the positive effects of mindfulness on known cardiovascular protective factors, such as physical activity, diet, and smoking cessation. They suggest a number of psychological pathways through which mindfulness may act on these factors, including enhanced attentional

control, improved emotion regulation, and greater self-awareness. Tacón, McComb, et al. (2003) found that mindfulness practice reduced anxiety and reactive coping styles in women with cardiac diagnoses. In a randomized controlled trial of community-dwelling adults reporting high levels of stress ($N = 88$), individuals who had been assigned to an MBSR condition had greater decreases in both systolic and diastolic blood pressure after being exposed to a stressful task than individuals in the wait list control group (Nyklíček, Mommersteeg, et al., 2013). The MBSR group also had a significantly smaller increase in blood pressure during the task. Similarly, Ditto, Eclache, and Goldman (2006) found that participants in a meditation group had significant increases in respiratory sinus arrhythmia, which measures parasympathetic activity, compared to both control and progressive muscle relaxation groups. They suggest that meditation may be particularly valuable for individuals with hypertension or other cardiac issues. Additionally, results of a meta-analysis of four studies completed by Lawrence and colleagues demonstrated that MBSR was effective at reducing blood pressure and stress levels in patients at high risk for ischemic stroke (Lawrence, Booth, et al., 2013).

Finally, recent work has elucidated the ways in which mindfulness is beneficial for cancer patients. Campbell, Labelle, et al. (2012) found that an MBSR program effectively increased mindful attention and decreased ruminative cognitive patterns in women with cancer. In another study, MBSR significantly improved mood, breast- and endocrine-related quality of life, and well-being in women with breast cancer compared to standard care (Hoffman, Ersser, et al., 2012). In a meta-analysis of 22 studies, mindfulness significantly reduced symptoms of depression and anxiety in cancer patients and survivors (Piet, Wurtzen, & Zachariae, 2012).

Reflecting the broad evidence for mindfulness-based interventions, Merkes (2010) suggested that by incorporating mindfulness practice into primary care, providers may not only improve the health and well-being of their patients but also contain healthcare costs, as mindfulness is a relatively inexpensive therapy to offer.

Assertive Community Treatment (ACT)

ACT is an evidence-based practice for persons with serious mental illnesses (Dixon, 2000; Stein & Test, 1980). ACT is best viewed as a platform for delivering services such as medication management, vocational and housing services, and psychosocial interventions (Stein & Santos, 1998) and is a multidisciplinary, team-based approach with a small (1:10) staff-to-consumer ratio, 24-hour staff availability, and aggressive outreach (Bond, Drake, et al., 2001; Dixon, 2000; Phillips, Burns, et al., 2001; Stein & Test, 1980). ACT team members typically draw from a range of disciplines and are likely to include a psychiatrist, nurse, social worker, psychologist, substance abuse specialist, housing specialist, and vocational rehabilitation specialist. They deliver or arrange comprehensive services including medication management and psychosocial supports in the community. Members of the team might visit the patient in the community at least once or several times a week and might also work with the patient's family or others important in the patient's life. Importantly, these meetings address how the patient can manage difficulties they have and live well in their family or community surroundings, following a model more of chronic disease management than cure.

ACT is one of the most widely studied interventions for persons with mental illness with clear evidence that ACT reduces hospital admissions and days, keeps individuals engaged in services, and increases housing stability compared to standard case management practices (Bond, Drake, et al., 2001; Burns & Santos, 1995; Dixon, 2000; Marshall & Lockwood, 2000). The large literature on ACT also includes a number of qualitative studies that have examined consumers' perceptions of what they like least about ACT (McGrew, Wilson, & Bond, 2002), what is helpful about ACT (McGrew, Wilson, & Bond, 1996), and general experiences with the model (Watts & Priebe, 2002).

ACT adheres to strict criteria with respect to its staffing, organizational structure, and delivery of its services. Until recently, the Dartmouth

Assertive Community Treatment Scale (DACTS) (Teague, Bond, & Drake, 1998) was the standard for assessing the fidelity of ACT teams to its original clinical model, and the DACTS was used to develop evidence in a number of randomized trials that demonstrated that high fidelity is associated with reduced psychiatric hospitalizations (Dieterich, Irving, et al., 2010; McHugo, Drake, et al., 1999). The DACTS was recently replaced by the Tool for Measurement of Assertive Community Treatment, or TMACT, which was developed as a recovery-informed update of the DACTS (Monroe-DeVita, Teague, & Moser, 2011). Similar to the DACTS, there is evidence that TMACT scores are associated with lower psychiatric hospital use (Cuddeback, Morrissey, et al., 2013).

ACT has realized a variety of adaptations and applications over the last 30 years, including urban and rural adaptations (Becker, Meisler, et al., 1999; Calsyn, Morse, et al., 1998; Dixon, Friedman, & Lehman, 1993; Lehman, Dixon, et al., 1997) and adaptations for persons with mental illness and co-occurring substance use disorders (Ackerson, 1995; Drake, McHugo, et al., 1998). Evidence-based practices such as integrated dual-disorder treatment (Ackerson, 1995; Drake, McHugo, et al., 1998), illness self-management (Mueser, Clark, et al., 2004), and supported employment (Gold, Meisler, et al., 2006) have successfully been added to the ACT model and ACT can be adapted to align with contemporary recovery practices (Kidd, George, et al., 2011; Kidd, George, et al., 2010; Salyers & Tsemberis, 2007).

ACT is an ideal setting in which to integrate mental health and physical healthcare. This is especially important given the high rates of chronic physical health issues experienced by persons with serious mental illness (Colton & Manderscheid, 2006). Indeed, integration of services, in general, is recognized as a key attribute of the ACT model (Bond, Drake, et al., 2001), which is promising in light of evidence that integrating primary and behavioral healthcare increases access to preventive health services and cardiovascular healthcare, improves engagement with primary care providers, and improves quality of life for adults with mental illness (Gilbody,

Bower, et al., 2006; Katon, Lin, et al., 2010; Rosenthal, 2008; Sheridan, Draeger, et al., 2011). Due to its aggressive, community-based outreach, integrated primary care ACT has the potential to be highly effective at engaging patients and keeping them connected to much-needed primary care services.

Integrative Role of Self-Management and Problem-Solving

Self-management programs in chronic disease may provide important models for approaches to psychopathology and distress in general as well as in the context of physical diseases. Surely the elements of self-management – healthy diet, physical activity, adherence to medication regimens, stress management, problem-solving, and cultivating family and friend support – would all seem equally pertinent to management of mental as well as physical health. Along these lines, a meta-analysis of interventions for depression and diabetes identified diabetes self-management education as contributing to the metabolic benefits associated with cognitive behavioral interventions (van der Feltz-Cornelis, Nuyen, et al., 2010). The “collaborative care” model of Katon and his colleagues (Katon, Von Korff, et al., 2004) stands as an important model of the integration of multiple behavioral objectives in self-management as well as the integration of self-management with clinical care in treating depression and other mental illnesses.

Within self-management, problem-solving may have a special role in integration of care for emotional distress and physical disease. Problem-solving is central to almost all models of self-management in chronic disease (Bodenheimer, Lorig, et al., 2002; Fisher, Brownson, et al., 2005; Funnell, Brown, et al., 2011; Hill-Briggs & Gemmell, 2007; Lorig & Holman, 2003). At the same time, problem solving has emerged as a prominent approach to psychotherapy for depression and other problems (D’Zurilla & Nezu, 1999). Indeed, research indicates that the benefits of cognitive behavior therapy for depression rest largely on the more behavioral, skill-oriented components of problem-solving and “behavioral

activation” (Cuijpers, van Straten, & Warmerdam, 2007; Dimidjian, Hollon, et al., 2006; Dobson, Hollon, et al., 2008). In a recent elaboration of peer support interventions, such as those discussed earlier (de Mello, de Jesus Mari, et al., 2005; Patel, Weiss, et al., 2011; Rahman, 2007; Rahman, Malik, et al., 2008), an intervention delivered by lay counselors and focusing on problem-solving, behavioral activation, and activation of social networks showed impressive initial benefits with severe depression (Chowdhary, Anand, et al., 2016). Thus, problem-solving can address the needs of both metabolic control and emotional management. For example, helping individuals to set objectives for increasing physical activity, take steps to accomplish those objectives, and reflect on the pleasure of reaching them may advance both self-management of chronic disease as well as mood and well-being.

Cautions when embracing problem-solving should consider the observation of Detweiler-Bedell and colleagues (Detweiler-Bedell, Friedman, et al., 2008) that self-management objectives for patients with a chronic illness and coexisting psychological or quality of life objectives are not necessarily synergistic or even compatible. With several conditions needing to be managed, “depletion of self-regulatory resources” (p. 1426) may lead to “under-regulation” of one. Also, effectively regulating one condition (e.g., mood repair by increasing pleasurable activities, e.g., dining) can negatively affect self-management of the other (e.g., compromised healthy diet for diabetes management), resulting in what the authors coin “misregulation.” What is needed is an integrated model of managing several problems, rather than organizing management of several problems as entailing separate management plans for each.

In addition to its effectiveness in both mental and physical health domains, an emphasis on problem-solving may provide just the integrative, coherent framework to which Detweiler-Bedell and colleagues point. Organizing care of multiple chronic diseases and psychological challenges as problem-solving or self-management to achieve healthy diet, physical activity, adherence to medications, stress management, and maintenance of satisfying social and community engagements

may provide patients a coherent framework for accommodating the changes that emerge inevitably in the natural history of chronic disease. It may also avoid concerns about stigma surrounding depression, other forms of emotional distress, or chronic diseases in many cultures.

It is often suggested that emotional distress must be addressed before individuals may be expected to marshal sufficient energy to manage chronic disease or address risks such as smoking cigarettes. There appears however to be little or no evidence to support this tactic. Indeed, the commonalities among the tasks of chronic disease management, prevention, and emotional well-being (e.g., physical activity) and the role of self-management and problem-solving as an integrating theme recommend encouraging patients’ healthy *behaviors*, including adherence to appropriate medical treatments, without drawing hard distinctions between emotional and physical health or concentrating on which should be treated first.

Self-management procedures emerged largely out of research on self-control and related processes in psychology, behavior therapy, and health psychology (Mahoney & Thoresen, 1974; Rachlin & Green, 1972; Stuart, 1967). This might lead one to expect great attention to self-management approaches to depression and other mental health problems that psychology has traditionally addressed. This does not, however, appear to be the case. In the diabetes literature, for example, a search of PubMed (12/31/16) for papers with “self-management” and cognates of “diabetes” in their titles yielded 1180 references, while a parallel search for papers with “self-management” and cognates of “depression” in their titles yielded only 84. When expanded to include mention in abstracts, results were 3282 for “self-management” with cognates of “diabetes” and 950 with cognates of “depression.” Further, many of those mentioning depression were focused on self-management of other diseases and simply included a measure of depression, not the focus of the self-management program. It should be noted that mental health researchers may use other terms, such as “psychotherapy,” “supportive therapy,” “bibliotherapy,” to refer to similar

services as “self-management.” Nevertheless, it appears that the *combination* of proactive medical treatment and self-management that constitutes the state of the art in many areas of chronic physical disease (Yarnall, Hayes, et al., 2012) has not been fully recognized in the treatment of mental health problems. This appears to be an area in which behavioral medicine and its strong models of self-management and chronic disease management may make substantial contributions to mental health prevention and care.

Closing Thoughts on Interventions

One hundred years ago, interventions for mental illness in the formal healthcare systems of Europe and North America consisted of hospital confinement, a very few medical and surgical procedures, individual psychotherapy – just emerging in psychoanalysis and limited to a very few recipients – and social service programs. Today, hospital confinement is drastically reduced although not necessarily improved, and medical and psychological interventions have grown enormously in number and in their evidence and differentiated application to specific problems and circumstances. At the same time, approaches addressing the community and social surround of mental health are emerging such as in the attention to community in ACT and in many peer support programs. Because of the limitations of a single chapter such as this, we have omitted important examples in addition to those described here. For example, the Triple P model of parenting and family support addresses a variety of developmental and psychological problems of children and their families. It entails multiple levels of intervention, from broad education of the community regarding the problems it addresses to parent skills training and family behavioral interventions (Guo, Morawska, & Sanders, 2016; Sanders, Mazzucchelli, & Studman, 2004). In Holland, Hogewey is a village designed to meet the needs of those with dementia. Staffed by professionals and volunteers, residents with dementia are able to live “normally” within the village (Jenkins & Smythe, 2013).

Across all of these and the interventions reviewed in the preceding sections, a crosscutting theme is integration of approaches. Just as state-of-the-art care of diabetes, for example, is not left to “take insulin and stay off sweets,” so state-of-the-art care of complex mental illness is not just a single psychiatric medication or a single, weekly hour of psychotherapy. Especially pertinent to the integration of care are internet- and mobile phone-based psychological and behavioral (self-help) interventions that offer unique opportunities for expanding reach even to whole populations at low costs (Andersson & Titov, 2014). Online interventions also offer the advantage of anonymity and low risk of stigmatization. Evidence to date suggests that internet-based psychological interventions for mental health problems are effective in a range of psychological and somatic chronic diseases and problems (Andrews, Cuijpers, et al., 2010; Richards & Richardson, 2012; van Bastelaar, POUWER, et al., 2011; van Beugen, Ferwerda, et al., 2014). An important feature of internet and “eHealth” applications is their ability to integrate information – clinical, behavioral, emotional, as well as environmental and neighborhood data – and integrate individuals and groups, including individuals with others facing similar problems, with families, or with professional and lay health workers.

Future Directions and Implications for Global Mental Health

Across the wide range of topics discussed in this chapter, integration stands out as an important theme, integration across (a) mental and physical disorders, (b) varieties and levels of psychological distress, from daily hassles and disease-specific distress to serious mental illness, (c) types and modes of care – medication, psychotherapy, community based, peer based, internet based, and (d) systems of care – specialty care, primary care, behavioral health, community health. In contrast, many of our health systems and our cognitive models of health reflect still a dualism that, in many respects, has not changed since Descartes. As much as the present authors

are proponents of integration, our writing does not always serve our intentions. The astute reader will note that we have several times distinguished between psychological or emotional problems and physical disease or physical illness in the pages that precede this. In addition to needing integrative models, the field needs, perhaps, integrative terminology.

In 1948, the World Health Organization announced an integrative definition of health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 1946). This was important in including the realms of “mental and social well-being” as part of health and of moving toward a definition of health as positive and substantive, not just the absence of something – “disease or infirmity.” Since then, and with the growing global burden of chronic disease, living well with a chronic condition or challenge has emerged as an important model of well-being but one that surely does not meet the criterion of “complete physical, mental and social well-being.”

A “dynamic” model of health has emerged (Huber, Knottnerus, et al., 2011) that not only integrates physical, mental, and social well-being but looks at them within the context of the natural incursions of health problems in the life course. So, health is not being 90 years old with no aches or pains, no problems remembering names, and the energy of a 21-year-old. Rather, health is being 90 with the “ability to adapt and self-manage” amidst the problems that 90 years may have brought. Rather than a “static” definition of health, we should pursue “a more dynamic one based on the resilience or capacity to cope and maintain and restore one’s integrity, equilibrium, and sense of wellbeing” (Huber, Knottnerus, et al., 2011; Larson, 1999).

Interestingly, this model of resilience or ability to cope can be considered at the physiological level as in resistance to the virus bringing the yearly flu, at the mental level as in the ability to cope, say, with the decline of favorite abilities with age, or at the social level as in the ability to revise one’s social ties following the changes brought about by retirement from work. This

dynamic approach that balances the challenges to health on the one hand with the resources of the individual to cope with them also accommodates the “disability paradox” in which individuals with appreciable physical disease may nevertheless rate their health as good, referring apparently to their ability to live well amidst their health challenges, not eliminate them (von Faber, Bootsma-van der Wiel, et al., 2001).

From such a perspective, then, this chapter’s examination of the co-occurrence of psychological and emotional problems with biological problems and challenges (we can no longer use “physical disease”) reflects both an integrative and dynamic model. Over the life course, biological, psychological, and social challenges are normal and sometimes grow to the extent they may earn the label of “disease” or “pathology,” again, biological, psychological, or social. Health and well-being are not the absence of these, but the ability of the biological, psychological, and social resources of the individual to meet or accommodate the challenges faced. The present chapter points then to the wide range of types and degrees of such psychological challenges and the correspondingly wide range of ways to assist individuals in coping with them and achieving wellbeing.

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