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ORIGINAL PAPER

Modeling Health Disparities and Outcomes in Disenfranchised Populations

Emily J. Hauenstein[1] · **Rachael S. Clark**[1] · **Elizabeth I. Merwin**[2]

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Abstract

The Health Disparities and Outcomes (HDO) model originally created to explain the complexity of obtaining healthcare in rural settings has been revised and updated using emerging theoretical models of adversity and inequity and two decades of empirical work by the authors. With a strong orientation to explaining population-based health inequities, the HDO is applied to individuals with Serious Mental Illness (SMI), to explain their high rates of morbidity and mortality compared to the general population. Individual-, community-, and system-level factors that reflect an understanding of life-long risk, accrued hazards associated with multiple and intersecting disadvantages, and difficulty obtaining healthcare that meets accepted standards are described. The revised HDO can be applied to populations with disproportionate health challenges to identify multi-level factors that affect illness trajectory and overall health outcomes.

Keywords Health disparities · Health outcomes · Intersectionality · Mental illness · Community characteristics

Health inequities stem in part from early disadvantages that increase vulnerability to illness, and from lack of access to treatment that meets established standards of care (Hauenstein 2008; Seng et al. 2012; Veenstra 2011; Walby 2007; Warner and Brown 2011; Winker and Degele 2011). Although recent theories and research soundly establish this relationship, few studies or conceptual frameworks capture the relationship between early and continuing individual disadvantages, inequities in the healthcare system, and health outcomes (Bird et al. 2010; Cheng and Solomon 2014; Halfon and Hochstein 2002). The Health Disparities and Outcomes (HDO) Model described in this article provides a systematic framework for understanding the inequitable distribution of accumulated health risk, health systems responses that mitigate or aggravate risk, and disparities in health outcomes. The proposed HDO Model is the third generation of a model originally proposed in the mid-90s (Fox et al. 1995), and the culmination of more than 25 years of theoretical and empirical work with disenfranchised populations. The authors declare that there are no known conflicts of interest and accept responsibility for the manuscript.

In its present iteration, the HDO Model has been strengthened to reflect emerging theory and methods for understanding the multilevel and intersecting influences of social disadvantage in health disparities. The model also provides a more detailed account of how healthcare access and the receipt of evidence-based care affect health outcomes. The authors provide a rich description of the HDO Model and its relationship to emerging theoretical, evidence, and policy research. The model is applied to those living with Serious Mental Illness (SMI) as one example of a disenfranchised group with intersecting disadvantages and disproportionate health challenges (e.g., poverty, gender, geography).

The HDO Model

The authors began modeling individual-, family- and community-level relationships and healthcare system characteristics in the mid-1990s beginning with the development of the deFacto Model of Rural Mental Health Care (Fox et al. 1995), which accounted for the poor healthcare received by mentally ill rural residents. This model depicted multiple pathways to care that rural residents might take to obtain

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✉ Emily J. Hauenstein
ehauenst@udel.edu

[1] University of Delaware, 25 N. College Avenue, Newark, DE 19716, USA

[2] School of Nursing, Duke University, 3027A Pearson Building, Durham, NC 27710, USA

mental health treatment (Fox et al. 1995; Pescosolido et al. 1998). Based on empirical work over the next two decades (Cox et al. 2008; Fox et al. 1995; Hauenstein 2008; Hauenstein and Peddada 2007; Hauenstein et al. 2006; Jameson and Blank 2010; Merwin et al. 2006; Pescosolido et al. 1998; Petterson et al. 2009; Stern et al. 2010), emergent work on the patient-provider interaction (Blanchard and Lurie 2004; Graumlich et al. 2016; Hudelson 2005; Kruse et al. 2013; Matthias et al. 2010; Meeusen and Porter 2015; Stiffman et al. 2004; White et al. 2016), and the Institute of Medicine's sentinel work on quality of care (Institute of Medicine [IOM], 2001, 2006), the model was revised to explain the relationship between multiple levels of influence on individual health status, health inequities, and the processes and outcomes of care (Hauenstein 2008; Saatcioglu and Corus 2014; Seng et al. 2012). The current version is also informed by our collective work focusing on outcomes associated with rurality, gender, mental health, health systems (DeGuzman et al. 2013; Hauenstein 1996, 2003, 2008, 2012; Hauenstein et al. 2006, 2007; Merwin et al. 2003, 2006), and accumulating evidence supporting life course and intersectionality theories (Halfon 2012; Halfon and Hochstein 2002; Hancock 2007; Simien 2007).

The HDO Model, depicted in Fig. 1, describes a detailed path from self-care capacity and health status to health outcomes over time, including the influence of the utilization of health care services. Supported by life course theory and influenced by ecological systems theory (Bronfenbrenner 1977), the left-hand side of the model accounts for inequities in health status associated with individual, family, and community factors (Cheng and Solomon 2014; Elder 1998). Health status is most directly affected by self-care capacity, individual health behaviors and choices, and is influenced directly and indirectly by family, social, and community contexts. At the heart of the model is the patient-centered health-care encounter in which patient and provider judgments about the patient's health status come together and result in a health intervention that ultimately affects the patient's current and future health status. The quality of that intervention and subsequent encounters with healthcare in the context of the patient's health choices and behaviors, over time, results in specific health outcomes, all modeled on the right-hand side of the model. The multiple and intersecting influences of gender, race, and geography, particularly rural residence, are key constructs affecting patient experience and outcome at every level of the HDO model and account for disparities in health for specific populations.

As a population health model, the HDO considers social and contextual factors that influence health inequities within families and population groups. By incorporating community and health system influences, it is possible to model health status and health outcomes for entire groups of patients. The model incorporates time as an important component. Growing up in poverty, experiencing child abuse or neglect or experiencing other early life challenges may have long lasting influences (Cheng and Solomon 2014; Halfon and Hochstein 2002). Health status and health outcomes are dynamic and iterative, and are influenced by multiple interactions with family, community, and health encounters occurring at the same time. Family conflict, low social support, and low levels of education can steer a trajectory downward, whereas the presence of family support, high SES, and strong social support can create a buffer (Kwon 2015). A multilevel model allows for exploration of complex

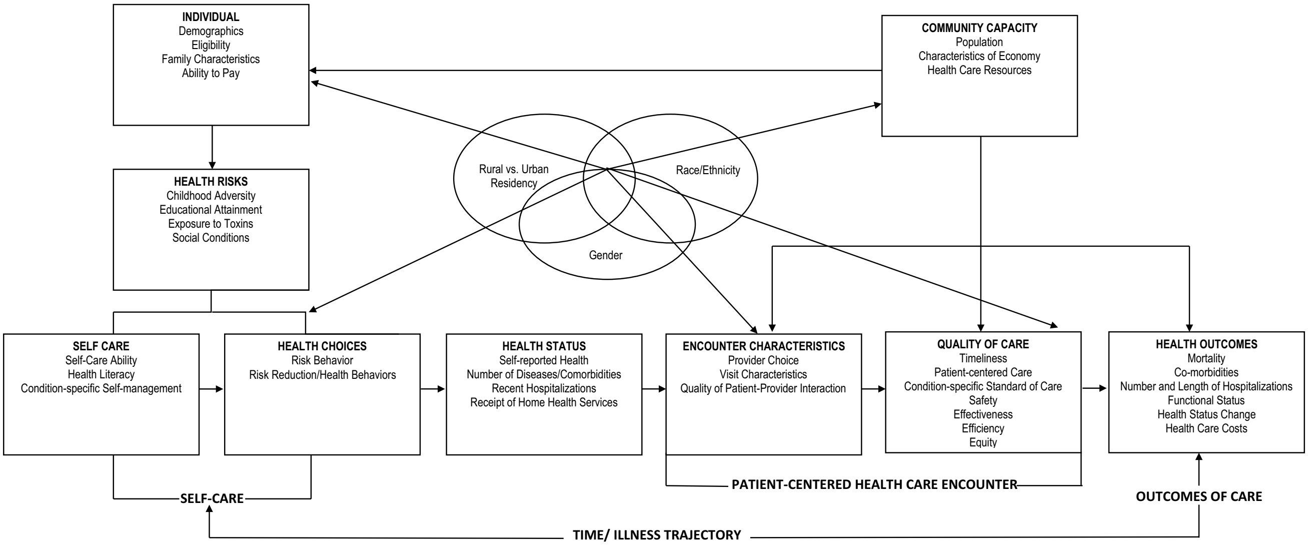

Fig. 1 Health disparities and their effects on outcomes for the seriously mentally ill

cross-level interaction effects of multiple factors known to contribute to health disparities.

Model Components

Individual, Family and Community Influences on Health Status

The left side of the HDO describes pathways and relationships that influence individual's health status overall, often measured at a discrete time point. HDO model components include *self-care capacity* and its antecedents of health risk and individual characteristics. Community characteristics affecting individual and family economic and social resources also are key influences in this aspect of the HDO model.

In the HDO Model, *health status* is a dynamic outcome that is consequent to the accumulated effects of personal characteristics and risks, and community influences that affect *self-care capacity* and *health choices*. Such influences include education and the ability to pay, family characteristics and experiences, and genetically and other acquired health conditions. The measure of *health status* reflects both subjective perceptions and observable indicators that, taken together, reflect overall health (Berger 2003). Although there is no universally accepted measure of health status, commonly used indicators include self-reported health, co-morbidities, history of hospitalizations, and global functioning (Berger 2003; Degenholtz et al. 2016; Whitson et al. 2016).

Immediately antecedent to health status and working conjointly are *self-care capacity* and *health choices*. Self-care capacity is the aggregate outcome of understanding what is needed to care for oneself, and the ability to follow through on that care. In the HDO, this includes self-care *ability*, the capability of determining what actions should be performed to care for oneself, as well as the operations performed in self-care (Söderhamn 1998). It also includes self-care management, a process patients use to manage specific health conditions like diabetes, prescribed medications, stress, or measures to prevent relapse (Hanrahan et al. 2011). Actual or perceived self-care capacity directly influences health behavior and choices.

Health choices are individual behaviors that affect health states (Poortaghi et al. 2015). *Health choices* include both positive health behaviors like eating well, avoidant behaviors like delaying healthcare, and risk behaviors like smoking (Iturralde et al. 2016). Much extant research on health behavior focuses on the free will of individuals to make choices or not for their health (Prochaska and DiClemente 1983). Yet free choice is often constrained by inequities in access to resources (Bird et al. 2010; Winker and Degele 2011). Sources of inequity includes inadequate education, insufficient insurance or other monetary resources, or lack of transportation. The inability to access an appropriate provider is included because the consequences of gender, race, or sexual orientation affect one's ability to freely engage in positive health behaviors or find support in avoiding risk behaviors.

Community Characteristics

There is growing evidence that the physical, social and other characteristics of the community have significant and enduring effects on the individual and collective health of residents (Carter et al. 2016; Cummins et al. 2007; Frohlich et al. 2001; Macintyre et al. 2002; Mason et al. 2010; Monson et al. 2016; Panelli and Gallagher 2003; Popay et al. 2003; Thomas et al. 2014; Winterton and Warburton 2011). These include the physical and built characteristics of communities that affect the availability of resources and the social, political, and economic features that shape individuals' identity of place and sense of belonging (Popay et al. 2003). In a systematic review of community factors affecting health status among the rural elderly, for example, Winterton and Warburton (2011) showed that sociodemographic and spatial characteristics of community and degree of community resources affected individual perceptions of the environment, perceived opportunities and capabilities, and perceived wellness. Likewise, perceived person-environment fit and neighborhood influences affected an array of social and health behaviors known to be associated with deleterious health outcomes (Popay et al. 2003). Community characteristics and resources directly and indirectly affect individual health status by modifying health risk through behavioral and adverse exposures, self-care capacity through available social resources, and health choices through community resources, values, and social supports (Halfon 2012; Halfon and Hochstein 2002; Miller and Chen 2010; White et al. 2009).

Health risks accrue as a consequence of a number of individual (genetics, sex), family (social status, poverty, values, behavior), and community (environment, social structure, social practices, toxic exposures) influences that come together as early as the second decade of life to produce a genetic and inflammatory environment that changes the health trajectory over time (Cheng and Solomon 2014; Evans and Kim 2010; Haas 2008; Miller and Chen 2010; Russ et al. 2014). Cumulative mechanisms result from sustained exposure to a toxin or stressor, and when occurring during a critical or sensitive period, can program a permanent change in functional systems (Strachan 1997; Bock et al. 1991; Wadsworth 1999). For example, accumulating risk factors are related to intellectual attainment and coronary heart disease (Epstein 1996; Kuh and Ben-Shlomo 2004; Lupien et al. 2009; McEwen 1998; Popolo et al.

2013; Sameroff et al. 1987, 1993). Responses to chronic stress accumulate and cascade throughout other systems, unfolding throughout the life course, resulting in negative health outcomes in adulthood (Cicchetti 2013). Research demonstrates the continued influence of early-life experiences on additional adult conditions such as depression and cardiovascular disease (Braveman and Barclay 2009), indicating the importance of including social factors in health disparities research.

Health System Influences on Health Outcomes

In addition to individual characteristics that affect health disparities, access to and use of quality health care also influences disparities. The right side of the HDO describes pathways and relationships that affect health outcomes over time. Components include the conditions and quality of the *patient-centered healthcare encounter* and *health outcomes*, and community influences that affect access to the appropriate care in the healthcare system. Individual and aggregate *health outcomes* are the end outcome measures of the HDO model. Population outcomes include morbidities and mortality, functional status, and the trajectory of health changes (Gold et al. 2002; Kindig 2007). Indices of system outcomes include frequency of hospitalizations, length of stay, and healthcare costs. *Health outcomes* are affected by structural and qualitative health system factors that determine what treatments, if any, individuals receive, whether or not the care provided reflects current evidence based standards, the health provider and sector in which care is received, and the timeliness, effectiveness, and continuity of treatment.

Central to achieving positive health outcomes is the *patient-centered health encounter*. The *patient-centered healthcare encounter* begins with initial entry into the health system and continues with subsequent visits for the original health concern and with the identification of each new health problem (Ben Natan and Hochman 2017; Schattner 2014). It refers to the interaction between an individual patient and his or her healthcare provider (and others that present with the patient including caregivers) in an episode of healthcare (Peek et al. 2016; Pilnick et al. 2009). It is *patient-centered* when the patient's autonomy is respected and he or she is included as a partner in decision-making processes (Entwistle et al. 2010; Hargraves et al. 2016; Schattner 2014). It has both descriptive and qualitative components including both the characteristics and context of individual visits and the overall quality of the encounter.

The placement of the *healthcare encounter* at the center of the HDO model underscores its pivotal role in improving, maintaining, or potentially worsening current health status. The Gateway Provider Model (Stiffman et al. 2004) for example, underscores how providers direct the patient's entry into the healthcare system, thereby initiating a cascade of events that create a trajectory of treatment and outcomes. Gateway providers influence the initial decision making of patients, their subsequent pathway through the healthcare system, the received treatment, and care outcomes (Stiffman et al. 2004). Thus, each encounter serves as an antecedent event that shapes future healthcare encounters. The effects and outcomes of each of these individual encounters aggregate over time and are considered within the model to affect both the trajectory of individual illness and overall long term *health outcomes* (Kaplan et al. 2015; Mistiaen et al. 2016; Ruberton et al. 2016).

The efficiency and effectiveness of the encounter is influenced by characteristics unique to the visit, patient, provider, and the community in which healthcare is provided. A typical visit creates a relationship between provider and patient as they discuss the presenting problem and move through an examination, diagnosis, and treatment proposal (Pilnick et al. 2009). The delivery of high-quality care in the encounter is influenced by building rapport, sharing values and being authentically engaged (Cole et al. 2017; Davies et al. 2017), as the patient and provider form an alliance to meet treatment goals (Allen et al. 2017).

Diagnostic accuracy and initiation of appropriate treatment is largely affected by the quality of the interaction between patient and provider. To achieve a quality interaction requires that the patient fully disclose symptoms and concerns. Patients without the knowledge or vocabulary to accurately describe their problems may lack sufficient cognitive resources, be anxious or afraid, or fail to clearly communicate with a provider who is culturally different from themselves (De Hert et al. 2011; Ellis et al. 2010; Schillinger et al. 2006). The skill of the provider in setting up an environment where patients feel accepted, unhurried, and able to fully discuss their health problems is essential to successful patient disclosure and ultimately determining the appropriate diagnosis and treatment (Davies et al. 2017; Dossett et al. 2015). Yet research has shown that healthcare providers often are unable to collaborate with patients efficiently, seldom check for patient understanding, and do not consistently use patient-centered language (Chhabra et al. 2013; Gerwing et al. 2016).

The community context of the *patient-centered health encounter* also can influence patient *health outcomes*. Impoverished, small, and/or isolated communities are unlikely to support an array of health resources necessary to support provider choice, and specialty practice (Acharya et al. 2016; Bird and Rieker 2008; Fox et al. 1995; Gerwing et al. 2016; Hauenstein 2008). At the community level, proximity to healthcare providers affects the standard of care for treatment of serious medical conditions (Boscoe 2011) and the rate of referral for mental health services (Calkins et al. 2013). The built environment may also influence the use of health resources. The lack of health resources and availability of qualified providers in facilities restricts individuals' access to treatment. Distance to provider and travel time are considered ecological barriers to access, and impede healthcare access (Drapalski et al. 2008). The availability of transportation to reach health resources is an important consideration in ensuring access one commonly cited as a barrier to accessing healthcare in individuals with SMI (Bellamy et al. 2017; Levesque et al. 2013; Moore et al. 2017).

Patient, provider, community, and other contextual factors all affect the second component of the *patient-centered encounter*—the quality of care that is delivered within the encounter. As determined by the Institute of Medicine Committee on the Quality of Health Care (IOM 2001), quality healthcare is defined as patient-centered and delivered in a timely, safe, effective, efficient, and equitable manner. More recently, these qualitative indicators were named as the triple aim for improving the healthcare system (Berwick et al. 2008). The *patient-centered health encounter* is considered successful if these qualitative metrics are achieved during a visit or visits occurring within an episode of healthcare (Hughes 2008; Mayberry et al. 2006).

Within the HDO, effective care is defined further as care that meets condition-specific professional standards of care. For example, appropriate care for conditions such as diabetes includes an assessment for comorbid conditions and lifestyle management recommendations (Cefalu 2017). Respect for patient culture and linguistic competence encourages high quality, patient-centered encounters (Beach et al. 2010; Dahlem et al. 2015), which can lead to improved outcomes (Dossett et al. 2015; Neumann et al. 2010) and medication adherence (Oetzel et al. 2015). Likewise, disrespect and discrimination negatively influence the interaction and make it less likely that patients will use health resources (Blanchard and Lurie 2004; Calo et al. 2015; Kruse et al. 2013; Hausmann et al. 2011).

Privacy concerns, important considerations for both patient and provider, are challenging to manage in rural areas. Interacting with healthcare personnel in public areas such as grocery stores contributes to patients' feelings of exposure (Leung et al. 2016). Seeking care, especially mental healthcare, may draw attention to the individual, and may be compounded by the social stigma attached to seeking treatment (Bachrach 1983; Hauenstein 2008; Haynes et al. 2017).

The Influence of Multiple Disadvantages

Although health disparities affecting specific populations have been well documented, equitable healthcare can be difficult to achieve (Hauenstein 2012; Piatt et al. 2010; Veenstra 2011). Throughout the HDO, geographic, gender, and racial influences are modeled as overlapping and additive. Inequity in the HDO is considered from the frame of intersectionality, the theoretical perspective that disadvantages associated with race and/or gender cannot be studied as independent vectors of potential inequity, but as intersecting influences that accumulate over the life span (Hankivsky et al. 2010; Tsouroufli et al. 2011). Disadvantage associated with a lifetime of poverty, for example, is considered differently for white and black women, and differently again for women and men. These relationships are further dependent on such characteristics as age, marital status, geographic location, race, and educational achievement. For example, members of minority groups have more chronic illnesses and higher rates of mortality than the general population (Jackson et al. 2016; Warner and Brown 2011). Black males continue to have the lowest life expectancy, and minorities have higher rates of obesity and hypertension than the general population (Clarke et al. 2010; Hill et al. 2017). Those with limited educational attainment have poor health status, in part because of less health literacy and decreased access to care (Balogun et al. 2017; Herd et al. 2007; Kaplan et al. 2015; Smith et al. 2010).

The life course perspective as it relates to *healthcare outcomes* is an essential component of the intersectionality perspective, as studies have shown that illness trajectories deteriorate more quickly over time within specific minority groups; African-American women have the worst disability trajectory when compared to other groups (Castner et al. 2015). This more rapidly deleterious trajectory is illustrated by research demonstrating that telomere length decreases at a steeper slope in African Americans than in whites (Hunt et al. 2008). Telomere length is used as a measure of age-related morbidity, and individuals in low socioeconomic conditions show shorter telomere length; the stress brought on by relatively poor circumstances causes consistent, unrelenting agitation of the stress response system and ultimately premature aging (Carroll et al. 2013). There is a robust and growing literature that shows that early life experiences such as living in poverty and witnessing violence have a major impact on health outcomes over the life course (Halfon and Hochstein 2002; Monnat and Chandler 2015), and adverse life experiences at an early age are associated with the very worst disability trajectories (Warner and Brown 2011). Being disadvantaged or poor, or living at a distance from health services can affect the frequency of treatment and provider choice (Grimes et al. 2011). It has been well established, for example, that distance and lack of transportation interferes with recommended medical treatment (Baum and Palmer 2002; Syed et al. 2013).

Evidence suggests that providers who listen carefully to their patients and provide clear explanations of their findings and recommendations, are more effective in addressing the health concerns of their patients (Hausmann et al. 2011; Qamar et al. 2011). Such patient-centeredness may not, however, be provided equitably. Women, for example, demonstrate a spectrum of symptoms for heart disease quite different from men in part due to gender-specific risk factors and selective disadvantage (Mehta et al. 2015). Women receive less intervention, possibly due to poor tolerance to treatment medications, which has resulted in higher mortality rates (Mehta et al. 2015; Raeisi-Giglou et al. 2017). Further, women have a greater prevalence of unmet healthcare needs compared to men even when age and socioeconomic status are controlled (Socías et al. 2016). Such discrimination and inequity in care delivery is also well documented for marginalized groups like the mentally ill, or for people of color (Cabassa et al. 2014; Dahlem et al. 2015; Detz et al. 2014; Haywood et al. 2014). When the interactional and contextual aspects of the patient-centered interaction are not realized, it is unlikely that effective care will be achieved (Mayberry et al. 2006; Robinson et al. 2010).

The HDO model, used in whole or in part, provides a framework for designing research that is inclusive of the multiple individual, family, community, and health system variables that affect health status and outcomes for individuals and populations. It models the relationships among these variables, embedding health status and outcomes within several levels of influence on outcomes. The model permits analysis of health status and outcomes at discrete time points and as a continuous path over time. Instead of treating gender or race as single discrete individual characteristics, the HDO models disadvantage associated with individual identities as intersecting and accruing within multiple identities and across time. Thus, the HDO model offers distinct advantages for conceptualizing population patterns of health disparities and proposing analytics that measure those often subtle, yet critical factors that contribute to poor health outcomes.

Using the HDO Model to Understand Health Outcomes in Those Living with Serious Mental Illness

There is convincing data that demonstrates excess morbidity and mortality in individuals with SMI, with death often occurring 13–32 years earlier than in the general population (Laursen et al. 2016; Liu et al. 2017; Piatt et al. 2010). This disparity in life span represents a staggering loss of potential (Miller et al. 2006). Poor health outcomes among adults with SMI stem from a high incidence of multiple co-morbid illnesses including obesity, diabetes, cardiovascular disease and depression (De Hert et al. 2011; Druss et al. 2011; Happell et al. 2012; Kawatkar et al. 2014; Miller et al. 2006; Piatt et al. 2010; Robson and Gray 2007). Chronic physical disease in those with SMI is due, in part, to medications that affect weight and blood sugar, but often treatment effects can be diminished or prevented when the patient engages in healthy behavior and health systems provide responsive, effective and timely care (De Hert et al. 2011; Viron and Stern 2010). The HDO model is applied here as a multilayered, multifaceted framework describing the putative contributors of devastating health outcomes in the SMI population. This review is limited to effects on health status and health outcomes consequent to the diagnosis of SMI.

Individual, Family, and Community Influences on the Health of Individuals with SMI

The *self-care capacity* of adults with SMI can be improved or diminished by the availability of help from family, friends, and the larger community. Healthcare choices may be constrained by existing comorbidities, impoverished living conditions, and the effects of identity discrimination based on gender or race (Bird et al. 2010; Chee Khoon 2009; Seng et al. 2012; Winker and Degele 2011). Family and friends can extend a loved one's *self-care capacity* by lending both instrumental and social support to improve physical and emotional functioning (Perry and Pescosolido 2015). Poor social skills combined with low income prevents individuals with SMI from visiting friends and relatives, inviting visitors to their homes, or going out for entertainment and social activities (Ljungqvist et al. 2016; Phelan et al. 2001). Individuals who have SMI often experience a decline in social class and status that further increases social isolation (Corrigan & Rüsch 2002; U.K. Department of Health 2002). Social networks are often further diminished when those with SMI relocate to access community resources, and are left to manage their day-to-day needs in isolation (Borba et al. 2012; Linz and Sturm 2013; Ljungqvist et al. 2016; Parry et al. 2007; Poortaghi et al. 2015). The precarious social position of many individuals with SMI contributes to poor daily functioning, diminished *self-care capacity* and over time, poor *health status* and long-term *health outcomes*.

The effects of illness, treatment, high-risk behaviors, low levels of health literacy, and poor health choices combine to contribute to poor health in individuals with SMI. One of the primary contributors to ill health in this population is antipsychotic medication. While leading to better intra- and inter-personal, and social functioning, these medications often cause weight gain and glucose dysregulation, which leads to increased risk of heart disease, stroke, and cardiovascular death (Thongsai et al. 2016; Viron and Stern 2010). The health risks associated with treatment of the primary SMI condition, however, can be reduced through adoption of healthy behaviors by the patient and careful management by health providers. Unfortunately, these chronic health conditions are exacerbated by poor health choices like smoking and inactivity (Collins et al. 2012; Robson and Gray 2007). Poor health practices can be a consequence of the patient's lack of understanding of the negative effects of risky behaviors and/or by fragmented thinking and compromised insight that are frequent concomitant symptoms in patients with SMI (Cubanski and Neuman 2010; De Hert et al. 2011; Kutner et al. 2006; Robson and Gray 2007; Viron and Stern 2010). In addition to cognitive dysfunction and lack of knowledge, those with SMI often struggle with the sedating effects of some medications or depression both of which decrease cognitive capacity and motivation to engage in self-care (Robson and Gray 2007). Self-medication for the devastating negative symptoms of SMI is common, so high rates of drug and alcohol use also contribute to poor *health outcomes* (Viron and Stern 2010). Poor compliance is a related problem for individuals with SMI; often the complex medication regimen exceeds the patient's capacity to manage essential treatments so they are less effective or omitted altogether (Poortaghi et al. 2015). Health literacy is key to understanding how to manage chronic illnesses and reduce the risk of hospitalization. In order to fully participate in collaborative physical and mental healthcare, individuals with SMI require a degree of health literacy and integration of physical and mental health services. However, people with SMI have a lower level of health literacy than the general population (De Hert et al. 2011). When low health literacy is combined with a fragmented care system, patients with SMI are left with unmet needs and poor health (Burton et al. 2013; Jayasinghe et al. 2016). Diminished self-care ability and poor health choices exacerbate the risks associated with mental illness and related health conditions (Robson and Gray 2007; Thongsai et al. 2016). Mental illness continues to be one of the most stigmatized conditions in society despite improvements in treatment and services over the past few decades (Chronister et al. 2013; Shrivastava et al. 2012). Disrespect and lack of empathy in the community create suffering and isolation for individuals with SMI (Vedana et al. 2017). Indeed, social exclusion was cited as the most frequent stigma experience among users of mental health services (Schulze 2007), and perceived stigma even prevents some from seeking treatment (Corrigan & Rüsch 2002).

Health System Influences on Health Outcomes for Individuals with SMI

Excessive morbidity and diminished life expectancy can be directly attributed to the often poor and fragmented healthcare that individuals with SMI receive. There is a robust literature demonstrating that those with SMI receive fewer physical health services than the general population (Collins et al. 2012; De Hert et al. 2011). Further, when individuals with SMI do receive healthcare, treatments are less likely to meet the standard of care (Happell et al. 2012). There are many reasons that this is so, but the two primary reasons are the ineffective patient-provider interaction and the dual system of payment for mental and physical health problems.

Patient-Provider Influences

Engaging in shared decision-making with a healthcare provider is associated with an improvement in outcomes (Clausen et al. 2016; Velligan et al. 2016, 2017). However, fragmented thinking and compromised insight into illnesses make proactive communication and recognition of physical symptoms difficult for individuals who have SMI (Hamann et al. 2003; Viron and Stern 2010; Wright-Berryman and Kim 2016). Diminished capacity to reason and act can contribute to risky behaviors and/or failure to engage in preventative health practices (Cubanski and Neuman 2010; De Hert et al. 2011; Robson and Gray 2007). Informed decision-making on the part of the patient may be influenced by cognitive impairments and depression, making some providers question the capacity of those with SMI to make strong health-related decisions (Raue et al. 2009). However, including the patient in decision-making about medication and a multidisciplinary approach that includes the patient's family can improve adherence (Velligan et al. 2016; Wright-Berryman and Kim 2016).

Negative experiences in the patient encounter may have a detrimental effect on the patient's compliance with treatment protocols. Disrespect from the provider in the form of lack of eye contact or not listening, as well as judgmental attitudes and prejudice, are experiences reported by individuals with SMI (Velligan et al. 2016). In addition to these quality indicators of the patient encounter, nurses report inadequate training, particularly in caring for patients with SMI (Blythe and White 2012), as well as role ambiguity and insecurity (Bradshaw and Pedley 2012). A supportive attitude and strong patient-provider relationships can enhance motivation for those with SMI to participate in treatment (Jochems et al. 2016; Hamann et al. 2003; Kang et al. 2017; Shuler 2014; Velligan et al. 2017).

Discrimination, Stigma, and Intersecting Disadvantages

Stigma, discrimination, and other intersecting disadvantages contribute to the excess morbidity and mortality in the SMI population over and beyond physical co-morbidities such as diabetes and cardiovascular disease (De Hert et al. 2011; Miller et al. 2006; Robson and Gray 2007). Stigma undermines the appropriate diagnosis and treatment of mental illness and impairs the ability of persons who have SMI to obtain assistance with physical and emotional care. Studies demonstrate the persistent fear and avoidance of those with mental illnesses, despite increasingly effective treatments and public acceptance of the causes of mental illness (Raue et al. 2009). There is still work to be done. Many continue to believe that individuals with schizophrenia are violent (Crisp et al. 2000) and fear and avoid people with mental illness. Physicians can find those with SMI challenging to work with, and some physicians find even treating individuals with SMI stigmatizing (Ehrlich et al. 2014).

Intersectionality and life course theories provide frameworks for understanding how poor quality patient-provider interaction, discrimination, and a failure to provide a standard of care for individuals who are SMI often results in negative *health outcomes* (Blixen et al. 2016; Chin et al. 1998; Chronister et al. 2013; Elder 1998; Galvan et al. 2017; Halfon and Hochstein 2002; Jayasinghe et al. 2016; Linz and Sturm 2013; Simien 2007). Multiple disadvantages, such as being female, a member of a minority group, impoverished, and/or being diagnosed with a SMI, set up individuals for a lifetime of accruing negative health outcomes (Warner and Brown 2011).

These intersecting disadvantages reduce the patient's ability to obtain effective, equitable healthcare. Discrimination by healthcare professionals decreases their ability to provide a positive healthcare experience and quality care (Cabassa et al. 2014). Further, poverty attendant with mental illness increases the likelihood that the individual with SMI will not have a regular healthcare provider (Fox et al. 1995; Galvan et al. 2017; Viron and Stern 2010), which reduces the likelihood of regular follow-up care, preventive services, or medication surveillance.

Dual System of Care

The poor articulation between physical and mental healthcare services in the United States often results in poorly coordinated and ineffective physical and mental healthcare for those with SMI (Collins et al. 2012; Pescosolido et al. 1999; Robson and Gray 2007; van Hasselt et al. 2013; Viron and Stern 2010). When mental health concerns are managed in one system, and physical healthcare in another, no one system takes responsibility to ensure the quality of the patient care encounter, the standard of care received in the encounter, and the timeliness or safe receipt of healthcare (IOM 2006). Thus, co-occurring and related conditions, common in the SMI population, are treated in separate locations (Happell et al. 2012; Robson and Gray 2007). In each sector of care, overspecialization and professional boundaries decrease the chance that individuals will receive integrated care that addresses both their physical and mental healthcare needs (Collins et al. 2012). Lack of clear guidelines on how patient care should be integrated, as well as concern that guidelines threaten autonomy, creates a muddy path to comprehensive healthcare (De Hert et al. 2011; van Hasselt et al. 2013). Further, primary care physicians often do not make referrals to mental health services, and those who do tend to follow up on them inconsistently (Paton et al. 2004).

For many individuals with SMI, a psychiatrist or other mental health professional is the only contact they have with the healthcare system (van Hasselt et al. 2013). Healthcare professionals tend to focus solely on mental health in patients with SMI, and physical health concerns may be dismissed as psychosomatic (Morlock 1989). Failure to adhere to standards of care for common health conditions, inadequate surveillance, and ineffective interaction by professionals contribute to poor outcomes (Cubanski and Neuman 2010; De Hert et al. 2011; Viron and Stern 2010). The lack of integrated healthcare leaves patients with SMI confused about what care they need, and how and where to obtain care. Individuals who live in rural areas, for example, must navigate fragmented services that are typically under-resourced and not close in proximity to their residences (Bachrach 1983; Hauenstein 2008). When the community is located in a rural area, follow-up and surveillance tends to be inconsistent (Hall et al. 1993). In addition to community factors, numerous studies cite the importance of social support as a facilitator of health service usage by those with SMI (Kane et al. 2001; Lawrence and Kisely 2010). Barriers to healthcare access in the community include travel time, difficulties in scheduling, and transportation barriers (Aschbrenner et al. 2017; Moore et al. 2017; Sorkin et al. 2016).

Conclusion

The HDO Model provides a framework for understanding health outcomes via multiple, intersecting disadvantages, namely the inequitable distribution of accumulated health risk, system responses that lessen or intensify risk, and disparities in health outcomes. Multilevel, intersecting influences of social disadvantage effect health disparities and are considered within the context of time and an illness trajectory. The healthcare encounter is a pivotal concept in understanding the direction and speed of the trajectory. The quality of care and quality of the healthcare encounter are crucial in determining health outcomes. Geographic location, gender, and race are intersecting disadvantages that influence all levels of the model.

The HDO Model can be applied in multiple research applications using multilevel approaches. Application of the model allows for a comprehensive and longitudinal overview of the healthcare received by numerous populations. Integrated datasets provide an opportunity to examine individual and group health outcomes and associated health system responses across groups and sub-groups. Nested data models can be used to account for individual scores in addition to aggregate units, and growth models may be used to track individual trajectories over time.

The HDO Model may be applied to any population with health disparities to explain how inequality can reduce overall health and inequities in the delivery of care. Inequity can prevent the receipt of quality of care, and in turn result in poor health outcomes. The HDO Model allows for multiple disadvantages to be examined simultaneously and to determine the impact those disadvantages have on health outcomes. The model accounts for individual and system behavior as well as external factors that affect behavior and choice, resulting in a more sophisticated understanding of the multilayered factors influencing health outcomes. In order to apply the model to another population it is important to fully understand the unique needs of the population and the prior research that allows for identifying the most relevant aspects of the concepts inherent to this model for the specific population. After the compounding influence of intersecting disadvantage has been mapped, practitioners can best address the physical and mental health concerns of disadvantaged populations and work toward their improved physical and psychological well-being.

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Compliance with Ethical Standards

Research Involving Human Participants and/or Animals This article does not contain any studies with human participants or animals performed by any of the authors.

References

Acharya, B., Hirachan, S., Mandel, J. S., & van Dyke, C. (2016). The mental health education gap among primary care providers in Rural Nepal. *Academic Psychiatry, 40*(4), 667–671.

Allen, M. L., Cook, B. L., Carson, N., Interian, A., La Roche, M., & Alegría, M. (2017). Patient-provider therapeutic alliance contributes to patient activation in community mental health clinics. *Administration and Policy in Mental Health and Mental Health Services Research, 44*(4), 431–440. https://doi.org/10.1007/s10488-015-0655-8.

Aschbrenner, K. A., Naslund, J. A., Gill, L., Hughes, T., O'Malley, A. J., Bartels, S. J., & Brunette, M. F. (2017). Qualitative analysis of social network influences on quitting smoking among individuals with serious mental illness. *Journal of Mental Health*. https://doi.org/10.1080/09638237.2017.1340600.

Bachrach, L. L. (1983). Psychiatric services in rural areas: A sociological overview. *Hospital and Community Psychiatry, 34*(3), 215–226.

Balogun, S. A., Yusuff, H. A., Yusuf, K. Q., Al-Shenqiti, A. M., Balogun, M. T., & Tettey, P. (2017). Maternal education and child immunization: The mediating roles of maternal literacy and socioeconomic status. *Pan African Medical Journal, 26*, 217. https://doi.org/10.11604/pamj.2017.26.217.11856.

Baum, F., & Palmer, C. (2002). 'Opportunity structures': Urban landscape, social capital and health promotion in Australia. *Health Promotion International, 17*(4), 351–361.

Beach, M. C., Saha, S., Korthuis, P. T., Sharp, V., Cohn, J., Wilson, I., … Moore, R. (2010). Differences in patient-provider communication for Hispanic compared to non-Hispanic white patients in HIV care. *Journal of General Internal Medicine, 25*(7), 682–687. https://doi.org/10.1007/s11606-010-1310-4.

Bellamy, C. D., Flanagan, E. H., Costa, M., O'Connell-Bonarrigo, M., Tana Le, T., Guy, K., … Steiner, J. L. (2017). Barriers and facilitators of healthcare for people with mental illness: Why integrated patient centered healthcare is necessary. *Issues in Mental Health Nursing, 37*(6), 421–428. https://doi.org/10.3109/01612840.2016.1162882.

Ben Natan, M., & Hochman, O. (2017). Patient-centered care in healthcare and its implementation in nursing. *International Journal of Caring Sciences, 10*(1), 596–600.

Berger, M. L. (2003). *Health care cost, quality, and outcomes: ISPOR book of terms*. Lawrenceville: International Society for Pharmacoeconomics and Outcomes Research.

Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The triple aim: Care, health, and cost. *Health Affairs, 27*(3), 759–769. https://doi.org/10.1377/hlthaff.27.3.759.

Bird, C. E., Lang, M. E., & Rieker, P. P. (2010). Changing gendered patterns of morbidity and mortality. In E. Kuhlmann, E. Annandale (Eds.), *The Palgrave handbook of gender and health care* (pp. 125–141). New York: Palgrave Macmillan.

Bird, C. E., & Rieker, P. P. (2008). *Gender and health: The effects of constrained choices and social policies*. Cambridge: Cambridge University Press.

Blanchard, J., & Lurie, N. (2004). RESPECT: Patient reports of disrespect in the health care setting and its impact on care. *Journal of Family Practice, 53*(9), 721–730.

Blixen, C. E., Kanuch, S., Perzynski, A. T., Thomas, C., Dawson, N. V., & Sajatovic, M. (2016). Barriers to self-management of serious mental illness and diabetes. *American Journal of Health Behavior, 40*(2), 194–204.

Blythe, J., & White, J. (2012). Role of the mental health nurse towards physical health care in serious mental illness: An integrative review of 10 years of UK literature. *International Journal of Mental Health Nursing, 21*(3), 193–201.

Bock, G., & Whelan, J. & Ciba Foundation (1991). *The childhood environment and adult disease*. Chichester: Wiley.

Borba, C. P., DePadilla, L., McCarty, F. A., von Esenwein, S. A., Druss, B. G., & Sterk, C. E. (2012). A qualitative study examining the perceived barriers and facilitators to medical healthcare services among women with a serious mental illness. *Womens Health Issues, 22*(2), e217–e224.

Boscoe, F. P. (2011). Geographic proximity to treatment for early stage breast cancer and likelihood of mastectomy. *Breast, 20*(4), 324–328. https://doi.org/10.1016/j.breast.2011.02.020.

Bradshaw, T., & Pedley, R. (2012). Evolving role of mental health nurses in the physical health care of people with serious mental health illness. *International Journal of Mental Health Nursing, 21*(3), 266–273.

Braveman, P., & Barclay, C. (2009). Health disparities beginning in childhood: A life-course perspective. *Pediatrics, 124*(Suppl 3), 163–175. https://doi.org/10.1542/peds.2009-1100D.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513–531.

Burton, L. M., Lichter, D. T., Baker, R. S., & Eason, J. M. (2013). Inequality, family processes, and health in the "New" Rural America. *American Behavioral Scientist, 57*(8), 1128–1151. https://doi.org/10.1177/0002764213487348.

Cabassa, L. J., Gomes, A. P., Meyreles, Q., Capitelli, L., Younge, R., Dragatsi, D., … Lewis-Fern·ndez, R. (2014). Primary health care experiences of hispanics with serious mental illness: A mixed-methods study. *Administration and Policy in Mental Health and Mental Health Services Research, 41*(6), 724–736.

Calkins, L. E., Michelson, I. R., & Corso, A. S. (2013). Provider proximity as a predictor of referral rate and success. *Psychological Services, 10*(4), 395–400. https://doi.org/10.1037/a0029988.

Calo, W. A., Cubillos, L., Breen, J., Hall, M., Rojas, K. F., Mooneyham, R., … Reuland, D. S. (2015). Experiences of Latinos with limited English proficiency with patient registration systems and their interactions with clinic front office staff: An exploratory study to inform community-based translational research in North Carolina. *BMC Health Services Research, 15*, 570.

Carroll, J. E., Diez-Roux, A. V., Adler, N. E., & Seeman, T. E. (2013). Socioeconomic factors and leukocyte telomere length in a multi-ethnic sample: Findings from the multi-ethnic study of atherosclerosis (MESA). *Brain, Behavior, and Immunity, 28*, 108–114. https://doi.org/10.1016/j.bbi.2012.10.024.

Carter, A., Greene, S., Nicholson, V., O'Brien, N., Dahlby, J., de Pokomandy, A., … Team, C. R. (2016). "It's a very isolating world': The journey to HIV care for women living with HIV in British Columbia, Canada. *Gender Place and Culture, 23*(7), 941–954. https://doi.org/10.1080/0966369x.2015.1073701.

Castner, J., Wu, Y.-W. B., Mehrok, N., Gadre, A., & Hewner, S. (2015). Frequent emergency department utilization and behavioral health diagnoses. *Nursing Research, 64*(1), 3–12. https://doi.org/10.1097/nnr.0000000000000065.

Cefalu, W. T. (2017). Standards of medical care in diabetes. *Diabetes Care, 40*(1), S120–S127.

Chee Khoon, C. (2009). Choosing health, constrained choices. *Global Health Promotion, 16*(4), 54–57. https://doi.org/10.1177/1757975909348131.

Cheng, T. L., & Solomon, B. S. (2014). Translating life course theory to clinical practice to address health disparities. *Maternal and Child Health Journal, 18*(2), 389–395. https://doi.org/10.1007/s10995-013-1279-9.

Chhabra, K. R., Pollak, K. I., Lee, S. J., Back, A. L., Goldman, R. E., & Tulsky, J. A. (2013). Physician communication styles in initial consultations for hematological cancer. *Patient Education and Counseling, 93*(3), 573–578. https://doi.org/10.1016/j.pec.2013.08.023.

Chin, M. H., Zhang, J. X., & Merrell, K. (1998). Diabetes in the African-American Medicare population: Morbidity, quality of care, and resource utilization. *Diabetes Care, 21*(7), 1090–1095.

Chronister, J., Chou, C.-C., & Liao, H.-Y. (2013). The role of stigma, coping, and social support in mediating the effect of social stigma on internalized stigma, mental health recovery, and quality of life among people with Serious Mental Illness. *Journal of Community Psychology, 41*(5), 582–600. https://doi.org/10.1002/jcop.21558.

Cicchetti, D. (2013). Annual research review: Resilient functioning in maltreated children–past, present, and future perspectives. *Journal of Child Psychology and Psychiatry, 54*(4), 402–422. https://doi.org/10.1111/j.1469-7610.2012.02608.x.

Clarke, C. A., Miller, T., Chang, E. T., Yin, D. X., Cockburn, M., & Gomez, S. L. (2010). Racial and social class gradients in life expectancy in contemporary California. *Social Science & Medicine, 70*(9), 1373–1380. https://doi.org/10.1016/j.socscimed.2010.01.003.

Clausen, W., Watanabe-Galloway, S., Bill Baerentzen, M., & Britigan, D. H. (2016). Health literacy among people with serious mental illness. *Community Mental Health Journal, 52*(4), 399–405. https://doi.org/10.1007/s10597-015-9951-8.

Cole, K. O. W., Gudzune, K. A., Bleich, S. N., Cheskin, L. J., Bennett, W. L., Cooper, L. A., & Roter, D. L. (2017). Providing prenatal care to pregnant women with overweight or obesity: Differences in provider communication and ratings of the patient-provider relationship by patient body weight. *Patient Education and Counseling, 100*(6), 1103–1110. https://doi.org/10.1016/j.pec.2016.12.030.

Collins, E., Tranter, S., & Irvine, F. (2012). The physical health of the seriously mentally ill: An overview of the literature. *Journal of Psychiatric and Mental Health Nursing, 19*(7), 638–646. https://doi.org/10.1111/j.1365-2850.2011.01831.x.

Corrigan, P., & Rüsch, N. (2002). Mental illness stereotypes and clinical care: Do people avoid treatment because of stigma? *American Journal of Psychiatric Rehabilitation, 6*(3), 312–334.

Cox, K., Mahone, I., & Merwin, E. (2008). Improving the quality of rural nursing care. *Annual Review of Nursing Research, 26*, 175–194.

Crisp, A. H., Gelder, M. G., Rix, S., Meltzer, H. I., & Rowlands, O. J. (2000). Stigmatisation of people with mental illnesses. *British Journal of Psychiatry, 177*, 4–7.

Cubanski, J., & Neuman, P. (2010). Medicare doesn't work as well for younger, disabled beneficiaries as it does for older enrollees. *Health Affairs, 29*(9), 1725–1733. https://doi.org/10.1377/hlthaff.2009.0962.

Cummins, S., Curtis, S., Diez-Roux, A. V., & Macintyre, S. (2007). Understanding and representing 'place' in health research: A relational approach. *Social Science & Medicine, 65*(9), 1825–1838. https://doi.org/10.1016/j.socscimed.2007.05.036.

Dahlem, C. H., Villarruel, A. M., & Ronis, D. L. (2015). African American women and prenatal care: Perceptions of patient-provider interaction. *Western Journal of Nursing Research, 37*(2), 217–235. https://doi.org/10.1177/0193945914533747.

Davies, B., Steele, R., Krueger, G., Albersheim, S., Baird, J., Bifirie, M., … Zhao, Y. (2017). Best practice in provider/parent interaction. *Qualitative Health Research, 27*(3), 406–420. https://doi.org/10.1177/1049732316664712.

De Hert, M., Cohen, D., Bobes, J., Cetkovich-Bakmas, M., Leucht, S., Ndetei, D. M., … Correll, C. U. (2011). Physical illness in patients with severe mental disorders. Barriers to care, monitoring and treatment guidelines, plus recommendations at the system and individual level. *World Psychiatry, 10*(2), 138–151.

Degenholtz, H. B., Park, M., Kang, Y. H., & Nadash, P. (2016). Variations among medicare beneficiaries living in different settings: Demographics, health status, and service use. *Research on Aging, 38*(5), 602–616. https://doi.org/10.1177/0164027515598557.

DeGuzman, P. B., Merwin, E. I., & Bourguignon, C. (2013). Population density, distance to public transportation, and health of women in low-income neighborhoods. *Public Health Nursing, 30*(6), 478–490. https://doi.org/10.1111/phn.12051.

Detz, A., Mangione, C. M., de Jaimes, F. N., Noguera, C., Morales, L. S., Tseng, C. H., & Moreno, G. (2014). Language concordance, interpersonal care, and diabetes self-care in Rural Latino patients. *Journal of General Internal Medicine, 29*(12), 1650–1656. https://doi.org/10.1007/s11606-014-3006-7.

Dossett, M. L., Mu, L., Davis, R. B., Bell, I. R., Lembo, A. J., Kaptchuk, T. J., & Yeh, G. Y. (2015). Patient-provider interactions affect symptoms in gastroesophageal reflux disease: A pilot randomized, double-blind, placebo-controlled trial. *PLoS ONE, 10*(9), e0136855. https://doi.org/10.1371/journal.pone.0136855.

Drapalski, A. L., Milford, J., Goldberg, R. W., Brown, C. H., & Dixon, L. B. (2008). Perceived barriers to medical care and mental health care among veterans with serious mental illness. *Psychiatric Services, 59*(8), 921–924.

Druss, B. G., Zhao, L., Von Esenwein, S., Morrato, E. H., & Marcus, S. C. (2011). Understanding excess mortality in persons with Mental Illness 17-year follow up of a nationally representative US survey. *Medical Care, 49*(6), 599–604. https://doi.org/10.1097/MLR.0b013e31820bf86e.

Ehrlich, C., Kendall, E., Frey, N., Kisely, S., & Crowe, E. (2014). Improving the physical health of people with severe mental illness: Boundaries of care provision. *International Journal of Mental Health Nursing, 23*(3), 243–251. https://doi.org/10.1111/inm.12050.

Elder, G. H. Jr. (1998). The life course as developmental theory. *Society for Research in Child Development, 69*(1), 1–12.

Ellis, B. H., Lincoln, A. K., Charney, M. E., Ford-Paz, R., Benson, M., & Strunin, L. (2010). Mental health service utilization of Somali adolescents: Religion, community, and school as gateways to healing. *Transcultural Psychiatry, 47*(5), 789–811. https://doi.org/10.1177/1363461510379933.

Entwistle, V. A., Carter, S. M., Cribb, A., & McCaffery, K. (2010). Supporting patient autonomy: The importance of clinician-patient relationships. *Journal of General Internal Medicine, 25*(7), 741–745. https://doi.org/10.1007/s11606-010-1292-2.

Epstein, F. H. (1996). Cardiovascular disease epidemiology: A journey from the past into the future. *Circulation, 93*(9), 1755–1764.

Evans, G. W., & Kim, P. (2010). Multiple risk exposure as a potential explanatory mechanism for the socioeconomic status-health gradient. In N. E. Adler & J. Stewart (Eds.), *Biology of disadvantage: Socioeconomic status and health* (Vol. 1186, pp. 174–189). San Francisco: University of California.

Fox, J., Merwin, E., & Blank, M. (1995). De Facto mental health services in the Rural South. *Journal of Health Care for the Poor and Underserved, 6*(4), 434–468. https://doi.org/10.1353/hpu.2010.0003.

Frohlich, K. L., Corin, E., & Potvin, L. (2001). A theoretical proposal for the relationship between context and disease. *Sociology of Health & Illness, 23*(6), 776–797.

Galvan, F. H., Bogart, L. M., Klein, D. J., Wagner, G. J., & Chen, Y. T. (2017). Medical mistrust as a key mediator in the association between perceived discrimination and adherence to antiretroviral therapy among HIV-positive Latino men. *Journal of Behavioral Medicine*. https://doi.org/10.1007/s10865-017-9843-1.

Gerwing, J., Indseth, T., & Gulbrandsen, P. (2016). A microanalysis of the clarity of information in physicians' and patients' discussions of treatment plans with and without language barriers. *Patient Education and Counseling, 99*(4), 522–529. https://doi.org/10.1016/j.pec.2015.10.012.

Gold, M. R., Stevenson, D., & Fryback, D. G. (2002). HALYs and QALYs and DALYs, oh my: Similarities and differences in summary measures of population health. *Annual Review of Public Health, 23*(1), 115–134.

Graumlich, J. F., Wang, H., Madison, A., Wolf, M. S., Kaiser, D., Dahal, K., & Morrow, D. G. (2016). Effects of a patient-provider, collaborative, medication-planning tool: A randomized, controlled trial. *Journal of Diabetes Research, 2016*(9), 1–16.

Grimes, C. E., Bowman, K. G., Dodgion, C. M., & Lavy, C. B. (2011). Systematic review of barriers to surgical care in low-income and middle-income countries. *World Journal of Surgery, 35*(5), 941–950. https://doi.org/10.1007/s00268-011-1010-1.

Haas, S. (2008). Trajectories of functional health: The 'long arm' of childhooc health and socioeconomic factors. *Social Science & Medicine, 66*, 849–861.

Halfon, N. (2012). Addressing health inequalities in the US: A life course health development approach. *Social Science & Medicine, 74*(5), 671–673. https://doi.org/10.1016/j.socscimed.2011.12.016.

Halfon, N., & Hochstein, M. (2002). Life course health development: An integrated framework for developing health, policy, and research. *Milbank Quarterly, 80*(3), 433–479. https://doi.org/10.1111/1468-0009.00019.

Hall, J. A., Epstein, A. M., DeCiantis, M. L., & McNeil, B. J. (1993). Physicians' liking for their patients: More evidence for the role of affect in medical care. *Health Psychology, 12*, 140–146.

Hamann, J., Leucht, S., & Kissling, W. (2003). Shared decision making in psychiatry. *Acta Psychiatrica Scandinavica, 107*(6), 403–409. https://doi.org/10.1034/j.1600-0447.2003.00130.x.

Hancock, A. (2007). Intersectionality as a normative and empirical paradigm. *Politics and Gender, 3*(2), 248–253.

Hankivsky, O., Reid, C., Cormier, R., Varcoe, C., Clark, N., Benoit, C., & Brotman, S. (2010). Exploring the promises of intersectionality for advancing women's health research. *International Journal for Equity in Health*. https://doi.org/10.1186/1475-9276-9-5.

Hanrahan, N. P., Rolin-Kenny, D., Roman, J., Kumar, A., Aiken, L., & Blank, M. (2011). Promoting self-care management among persons with serious mental illness and HIV. *Home Health Care Management and Practice, 23*(6), 421–427. https://doi.org/10.1177/1084822311405457.

Happell, B., Scott, D., Platania-Phung, C., & Nankivell, J. (2012). Should we or shouldn't we? Mental health nurses' views on physical health care of mental health consumers. *International Journal of Mental Health Nursing, 21*(3), 202–210. https://doi.org/10.1111/j.1447-0349.2011.00799.x.

Hargraves, I., LeBlanc, A., Shah, N. D., & Montori, V. M. (2016). Shared decision making: The need for patient-clinician conversation, not just information. *Health Affairs, 35*(4), 627–629. https://doi.org/10.1377/hlthaff.2015.1354.

Hauenstein, E. J. (1996). A nursing practice paradigm for depressed rural women: Theoretical basis. *Archives of Psychiatric Nursing, 10*(5), 283–292. https://doi.org/10.1016/s0883-9417(96)80037-9.

Hauenstein, E. J. (2003). No comfort in the Rural South: Women living depressed. *Archives of Psychiatric Nursing, 17*(1), 3–11.

Hauenstein, E. J. (2008). Building the rural mental health system: From De Facto system to quality care. *Annual Review of Nursing Research, 26*, 143–173.

Hauenstein, E. J. (2012). Women and depression: Theoretical perspectives and research outcomes. In J. J. Fitzpatrick & M. W. Kazer (Eds.), *Encyclopedia of nursing research* (3rd ed., pp. 119–122). New York: Springer Publishing Company.

Hauenstein, E. J., & Peddada, S. D. (2007). Prevalence of major depressive episodes in Rural Women using primary care. *Journal of Health Care for the Poor & Underserved, 18*(1), 185–202.

Hauenstein, E. J., Petterson, S., Merwin, E., Rovnyak, V., Heise, B., & Wagner, D. (2006). Rurality, gender, and mental health treatment. *Family & Community Health, 29*(3), 169–185.

Hauenstein, E. J., Petterson, S., Rovnyak, V., Merwin, E., Heise, B., & Wagner, D. (2007). Rurality and mental health treatment. *Administration and Policy in Mental Health*. https://doi.org/10.1007/s10488-006-0105-8.

Hausmann, L. R. M., Hannon, M. J., Kresevic, D. M., Hanusa, B. H., Kwoh, C. K., & Ibrahim, S. A. (2011). Impact of perceived discrimination in health care on patient-provider communication. *Medical Care, 49*(7), 626–633. https://doi.org/10.1097/MLR.0b013e318215d93c.

Haynes, T. F., Cheney, A. M., Sullivan, J. G., Bryant, K., Curran, G. M., Olson, M., … Reaves, C. (2017). Addressing mental health needs: Perspectives of African Americans living in the Rural South. *Psychiatric Services, 68*(6), 573–578. https://doi.org/10.1176/appi.ps.201600208.

Haywood, C., Lanzkron, S., Bediako, S., Strouse, J. J., Haythornthwaite, J., Carroll, C. P., … Investigators, I. (2014). Perceived discrimination, patient trust, and adherence to medical recommendations among persons with sickle cell disease. *Journal of General Internal Medicine, 29*(12), 1657–1662. https://doi.org/10.1007/s11606-014-2986-7.

Herd, P., Goesling, B., & House, J. S. (2007). Socioeconomic position and health: The differential effects of education versus income on the onset versus progression of health problems. *Journal of Health and Social Behavior, 48*(3), 223–238.

Hill, S. E., Bell, C., Bowie, J. V., Kelley, E., Furr-Holden, D., LaVeist, T. A., & Thorpe, R. J. (2017). Differences in obesity among men of diverse racial and ethnic background. *American Journal of Mens Health, 11*(4), 984–989. https://doi.org/10.1177/1557988315580348.

Hudelson, P. (2005). Improving patient-provider communication: Insights from interpreters. *Family Practice, 22*(3), 311–316. https://doi.org/10.1093/fampra/cmi015.

Hughes, R., & United States (2008). *Patient safety and quality: An evidence-based handbook for nurses*. Rockville: Agency for Healthcare Research and Quality.

Hunt, S. C., Chen, W., Gardner, J. P., Kimura, M., Srinivasan, S. R., Eckfeldt, J. H., … Aviv, A. (2008). Leukocyte telomeres are longer in African Americans than in Whites: The National Heart, Lung, and Blood Institute Family Heart Study and the Bogalusa Heart Study. *Aging Cell, 7*(4), 451–458. https://doi.org/10.1111/j.1474-9726.2008.00397.x.

Institute of Medicine (U.S.). (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, D.C: National Academy Press.

Institute of Medicine (U.S.). (2006). *Improving the quality of health care for mental and substance-use conditions*. Washington, DC: National Academies Press.

Iturralde, E., Weissberg-Benchell, J., & Hood, K. K. (2016). Avoidant coping and diabetes-related distress: Pathways to adolescents' Type 1 diabetes outcomes. *Health Psychology, 36*(3), 236–244. https://doi.org/10.1037/hea0000445.

Jackson, C. S., Oman, M., Patel, A. M., & Vega, K. J. (2016). Health disparities in colorectal cancer among racial and ethnic minorities in the United States. *Journal of Gastrointestinal Oncology, 7*(Suppl 1), 32–43. https://doi.org/10.3978/j.issn.2078-6891.2015.039.

Jameson, J. P., & Blank, M. (2010). Diagnosis and treatment of depression and anxiety in rural and nonrural primary care: National survey results. *Psychiatric Services, 61*(6), 624–627.

Jayasinghe, U. W., Harris, M. F., Parker, S. M., Litt, J., van Driel, M., & Mazza, D., … On behalf of the Preventive Evidence into Practice Partnership (2016). The impact of health literacy and life style risk factors on health-related quality of life of Australian patients. *Health and Quality of Life Outcomes, 14*, 68. https://doi.org/10.1186/s12955-016-0471-1. G.

Jochems, E. C., van Dam, A., Duivenvoorden, H. J., Scheffer, S. C., van der Feltz-Cornelis, C. M., & Mulder, N. L. (2016). Different perspectives of clinicians and patients with severe mental illness on motivation for treatment. *Clinical Psychology & Psychotherapy, 23*(5), 438–451.

Kane, C. F., Thompson-Heisterman, A., Hinton, I. D., Burkett, B. J., Merwin, E., & Chen, D. (2001). In *Outcomes for patients discharged from state psychiatric inpatient care*. Charlottesville: Report prepared for Office of the Inspector General, Southeastern Rural Mental Health Research Center, University of Virginia Health System.

Kang, J. S., Kim, E., Park, J., Medalia, A., & Choi, K.-H. (2017). The role of clinician in learning and motivation during cognitive remediation for people with severe mental illness. *Schizophrenia Bulletin, 43*(1), S215.

Kaplan, R. M., Howard, V. J., Safford, M. M., & Howard, G. (2015). Educational attainment and longevity: Results from the REGARDS US national cohort study of blacks and whites. *Annals of Epidemiology, 25*(5), 323–328. https://doi.org/10.1016/j.annepidem.2015.01.017.

Kawatkar, A. A., Knight, T. K., Moss, R. A., Sikirica, V., Chu, L. H., Hodgkins, P., … Nichol, M. B. (2014). Impact of mental health comorbidities on health care utilization and expenditure in a large US managed care adult population with ADHD. *Value in Health, 17*(6), 661–668. https://doi.org/10.1016/j.jval.7014.06.002.

Kindig, D. A. (2007). Understanding population health terminology. *The Milbank Quarterly, 85*(1), 139–161.

Kruse, R. L., Olsberg, J. E., Oliver, D. P., Shigaki, C. L., Vetter-Smith, M. J., & LeMaster, J. W. (2013). Patient-provider communication about diabetes self-care activities. *Family Medicine, 45*(5), 319–322.

Kuh, D., & Ben-Shlomo, Y. (2004). *A life course approach to chronic disease epidemiology*. Oxford: Oxford University Press.

Kutner, M., Greenburg, E., Jin, Y., & Pausen, C. (2006). *Health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy*. Washington: US Department of Education. Retrieved from http://search.ebscohost.com/direct.asp?db=ehh&jid=%223GV1%22&scope=site.

Kwon, T. Y. (2015). Identifying depressive symptom trajectory groups among Korean adults and psychosocial factors as group determinants. *International Journal of Social Psychiatry, 61*, 394–403. https://doi.org/10.1177/0020764015573847.

Laursen, T. M., Musliner, K. L., Benros, M. E., Vestergaard, M., & Munk-Olsen, T. (2016). Mortality and life expectancy in persons with severe unipolar depression. *Journal of Affective Disorders, 193*, 203–207. https://doi.org/10.1016/j.jad.2015.12.067.

Lawrence, D., & Kisely, S. (2010). Inequalities in healthcare provision for people with severe mental illness. *Journal of Psychopharmacology, 24*(Suppl 4), 61–68.

Leung, J., Smith, A., Atherton, I., & McLaughlin, D. (2016). "Everybody knows everybody else's business"—Privacy in Rural communities. *Journal of Cancer Education, 31*(4), 811–812. https://doi.org/10.1007/s13187-015-0862-8.

Levesque, J. F., Harris, M. F., & Russell, G. (2013). Patient-centred access to health care: Conceptualising access at the interface of health systems and populations. *International Journal of Equity in Health*. https://doi.org/10.1186/1475-9276-12-18.

Linz, S. J., & Sturm, B. A. (2013). The phenomenon of social isolation in the severely mentally ill. *Perspectives in Psychiatric Care, 49*(4), 243–254.

Liu, N. H., Daumit, G. L., Dua, T., Aquila, R., Charlson, F., Cuijpers, P., … Saxena, S. (2017). Excess mortality in persons with severe mental disorders: A multilevel intervention framework and priorities for clinical practice, policy and research agendas. *World Psychiatry, 16*(1), 30–40. https://doi.org/10.1002/wps.20384.

Ljungqvist, I., Topor, A., Forssell, H., Svensson, I., & Davidson, L. (2016). Money and mental illness: A study of the relationship between poverty and serious psychological problems. *Community Mental Health Journal, 52*(7), 842–850. https://doi.org/10.1007/s10597-015-9950-9.

Lupien, S. J., McEwen, B. S., Gunnar, M. R., & Heim, C. (2009). Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nature Reviews Neuroscience, 10*(6), 434–445. https://doi.org/10.1038/nrn2639.

Macintyre, S., Ellaway, A., & Cummins, S. (2002). Place effects on health: How can we conceptualise, operationalise and measure them? *Social Science & Medicine, 55*(1), 125–139. https://doi.org/10.1016/s0277-9536(01)00214-3.

Mason, M. J., Korpela, K., Mennis, J., Coatsworth, J. D., Valente, T. W., Pomponio, A., & Pate, P. A. (2010). Patterns of place based self regulation and associated mental health of urban adolescents. *Journal of Community Psychology, 38*(2), 155–171.

Matthias, M. S., Parpart, A. L., Nyland, K. A., Huffman, M. A., Stubbs, D. L., Sargent, C., & Bair, M. J. (2010). The patient-provider relationship in chronic pain care: Providers' perspectives. *Pain Medicine, 11*(11), 1688–1697. https://doi.org/10.1111/j.1526-4637.2010.00980.x.

Mayberry, R. M., Nicewander, D. A., Qin, H., & Ballard, D. J. (2006). Improving quality and reducing inequities: A challenge in achieving best care. *Baylor University Medical Center Proceedings*, *19*(2), 103–118.

McEwen, B. S. (1998). Stress, adaptation, and disease—Allostasis and allostatic load. In S. M. McCann, J. M. Lipton, E. M. Sternberg, G. P. Chrousos, P. W. Gold & C. C. Smith (Eds.), *Neuroimmunomodulation: Molecular aspects, integrative systems, and clinical advances* (Vol. 840, pp. 33–44). New York: New York Academy of Sciences.

Meeusen, A. J., & Porter, R. (2015). Patient-reported use of personalized video recordings to improve neurosurgical patient-provider communication. *Cureus, 7*(6), e273. https://doi.org/10.7759/cureus.273.

Mehta, P. K., Wei, J., & Wenger, N. K. (2015). Ischemic heart disease in women: A focus on risk factors. *Trends in Cardiovascular Medicine, 25*(2), 140–151. https://doi.org/10.1016/j.tcm.2014.10.005.

Merwin, E., Hinton, I., Dembling, B., & Stern, S. (2003). Shortages of rural mental health professionals. *Archives of Psychiatric Nursing, 17*(1), 42–51. https://doi.org/10.1053/apnu.2003.1.

Merwin, E., Snyder, A., & Katz, E. (2006). Differential access to quality rural healthcare—Professional and policy challenges. *Family & Community Health, 29*(3), 186–194.

Miller, B. J., Paschall, C. B., III, & Svendsen, D. P. (2006). Mortality and medical comorbidity among patients with serious mental illness. *Psychiatric Services, 57*(10), 1482–1487.

Miller, G. E., & Chen, E. (2010). Harsh family climate in early life presages the emergence of a proinflammatory phenotype in adolescence. *Psychological Science, 21*(6), 848–856. https://doi.org/10.1177/0956797610370161.

Mistiaen, P., Osch, M., Vliet, L., Howick, J., Bishop, F. L., Di Blasi, Z., … Dulmen, S. (2016). The effect of patient-practitioner communication on pain: A systematic review. *European Journal of Pain, 20*(5), 675–688.

Monnat, S. M., & Chandler, R. F. (2015). Long-term physical health consequences of adverse childhood experiences. *The Sociological Quarterly, 56*(4), 723–752. https://doi.org/10.1111/tsq.12107.

Monson, E., Paquet, C., Daniel, M., Brunet, A., & Caron, J. (2016). Place and posttraumatic stress disorder. *Journal of Traumatic Stress, 29*(4), 293–300. https://doi.org/10.1002/jts.22108.

Moore, R. C., Marquine, M. J., Straus, E., Depp, C. A., Moore, D. J., Schiehser, D. M., … Eyler, L. T. (2017). Predictors and barriers to mental health treatment utilization among older veterans living with HIV. *The Primary Care Companion for CNS Disorders*. https://doi.org/10.4088/PCC.16m02059.

Morlock, L. L. (1989). Recognition and treatment of mental health problems in the general health sector. In C. A. Taube, D. Mechanic & A. A. Hohmann (Eds.), *The future of mental health services research* (pp. 39–61). Rockville: National Institute of Mental Health.

Neumann, M., Edelhauser, F., Kreps, G. L., Scheffer, C., Lutz, G., Tauschel, D., & Visser, A. (2010). Can patient-provider interaction increase the effectiveness of medical treatment or even substitute it?—An exploration on why and how to study the specific effect of the provider. *Patient Education and Counseling, 80*(3), 307–314. https://doi.org/10.1016/j.pec.2010.07.020.

Oetzel, J., Wilcox, B., Avila, M., Hill, R., Archiopoli, A., & Ginossar, T. (2015). Patient-provider interaction, patient satisfaction, and health outcomes: testing explanatory models for people living with HIV/AIDS. *AIDS Care, 27*(8), 972–978. https://doi.org/10.1080/09540121.2015.1015478.

Panelli, R., & Gallagher, L. M. (2003). "It's your whole way of life really": Negotiating work, health and gender. *Health & Place, 9*(2), 95–105.

Parry, C. D., Blank, M. B., & Pithey, A. L. (2007). Responding to the threat of HIV among persons with mental illness and substance abuse. *Current Opinions in Psychiatry, 20*(3), 235–241.

Paton, C., Esop, R., Young, C., & Taylor, D. (2004). Obesity, dyslipidaemias and smoking in an inpatient population treated with antipsychotic drugs. *Acta Psychiatrica Scandinavica, 110*(4), 299–305. https://doi.org/10.1111/j.1600-0447.2004.00372.x.

Peek, M. E., Lopez, F. Y., Williams, H. S., Xu, L. J., McNulty, M. C., Acree, M. E., & Schneider, J. A. (2016). Development of a conceptual framework for understanding shared decision making among African-American LGBT patients and their clinicians. *Journal of General Internal Medicine, 31*(6), 677–687.

Perry, B. L., & Pescosolido, B. A. (2015). Social network activation: the role of health discussion partners in recovery from mental illness. *Social Science & Medicine, 125*, 116–128. https://doi.org/10.1016/j.socscimed.2013.12.033.

Pescosolido, B. A., Gardner, C. B., & Lubell, K. M. (1998). How people get into mental health services: Stories of choice, coercion and "muddling through" from "first-timers". *Social Science & Medicine, 46*(2), 275–286.

Pescosolido, B. A., Monahan, J., Link, B. G., Stueve, A., & Kikuzawa, S. (1999). The public's view of the competence, dangerousness, and need for legal coercion of persons with mental health problems. *American Journal of Public Health, 89*(9), 1339–1345. https://doi.org/10.2105/ajph.89.9.1339.

Petterson, S., Williams, I. C., Hauenstein, E. J., Rovnyak, V., & Merwin, E. (2009). Race and ethnicity and rural mental health treatment. *Journal of Health Care for the Poor and Underserved, 20*(3), 662–677.

Phelan, M., Stradins, L., & Morrison, S. (2001). Physical health of people with severe mental illness—Can be improved if primary care and mental health professionals pay attention to it. *British Medical Journal, 322*(7284), 443–444. https://doi.org/10.1136/bmj.322.7284.443.

Piatt, E. E., Munetz, M. R., & Ritter, C. (2010). An examination of premature mortality among decedents with Serious Mental Illness and those in the general population. *Psychiatric Services, 61*(7), 663–668.

Pilnick, A., Hindmarsh, J., & Gill, V. T. (2009). Beyond 'doctor and patient': Developments in the study of healthcare interactions. *Sociology of Health & Illness, 31*(6), 787–802. https://doi.org/10.1111/j.1467-9566.2009.01194.x.

Poortaghi, S., Raiesifar, A., Bozorgzad, P., Golzari, S. E., Parvizy, S., & Rafii, F. (2015). Evolutionary concept analysis of health seeking behavior in nursing: A systematic review. *BMC Health Services Research, 15*, 523. https://doi.org/10.1186/s12913-015-1181-9.

Popay, J., Thomas, C., Williams, G., Bennett, S., Gatrell, A., & Bostock, L. (2003). A proper place to live: Health inequalities, agency and the normative dimensions of space. *Social Science & Medicine, 57*, 55–69.

Popolo, A., Autore, G., Pinto, A., & Marzocco, S. (2013). Oxidative stress in patients with cardiovascular disease and chronic renal failure. *Free Radical Research, 47*(5), 346–356. https://doi.org/10.3109/10715762.2013.779373.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), 390–395.

Qamar, N., Pappalardo, A. A., Arora, V. M., & Press, V. G. (2011). Patient-centered care and its effect on outcomes in the treatment of asthma. *Patient Related Outcome Measures, 2*, 81–109. https://doi.org/10.2147/PROM.S12634.

Raeisi-Giglou, P., Volgman, A. S., Patel, H., Campbell, S., Villablanca, A., & Hsich, E. (2017). Advances in Cardiovascular Health in women over the past decade: Guideline recommendations for practice. *Journal of Womens Health*. https://doi.org/10.1089/jwh.2016.6316.

Raue, P. J., Schulberg, H. C., Heo, M., Klimstra, S., & Bruce, M. L. (2009). Patients' depression treatment preferences and initiation, adherence, and outcome: A randomized primary care study. *Psychiatric Services, 60*(3), 337–343.

Robinson, J. D., Turner, J. W., Levine, B., & Tian, Y. (2010). Patient-provider interaction and the regulation of diabetes mellitus. *Health Communication, 25*(6–7), 597–598. https://doi.org/10.1080/10410236.2010.496831.

Robson, D., & Gray, R. (2007). Serious mental illness and physical health problems: A discussion paper. *International Journal of Nursing Studies, 44*(3), 457–466. https://doi.org/10.1016/j.ijnurstu.2006.07.013.

Ruberton, P. M., Huynh, H. P., Miller, T. A., Kruse, E., Chancellor, J., & Lyubomirsky, S. (2016). The relationship between physician humility, physician-patient communication, and patient health. *Patient Education and Counseling, 99*(7), 1138–1145.

Russ, S. A., Larson, K., Tullis, E., & Halfon, N. (2014). A lifecourse approach to health development: Implications for the maternal and child health research agenda. *Maternal and Child Health Journal, 18*(2), 497–510. https://doi.org/10.1007/s10995-013-1284-z.

Saatcioglu, B., & Corus, C. (2014). Poverty and intersectionality: A multidimensional look into the lives of the impoverished. *Journal of Macromarketing, 34*(2), 122–132. https://doi.org/10.1177/0276146713520600.

Sameroff, A. J., Seifer, R., Baldwin, A., & Baldwin, C. (1993). Stability of intelligence from preschool to adolescence: The influence of social and family risk factors. *Child Development, 64*(1), 80–97. https://doi.org/10.1111/j.1467-8624.1993.tb02896.x.

Sameroff, A. J., Seifer, R., Barocas, R., Zax, M., & Greenspan, S. (1987). Intelligence quotient scores of 4-year old children: Social-environmental risk factors. *Pediatrics, 79*(3), 343–350.

Schattner, A. (2014). The clinical encounter revisited. *American Journal of Medicine, 127*(4), 268–274. https://doi.org/10.1016/j.amjmed.2013.11.015.

Schillinger, D., Wang, F., Rodriguez, M., Bindman, A., & Machtinger, E. L. (2006). The importance of establishing regimen concordance in preventing medication errors in anticoagulant care. *Journal of Health Communication, 11*(6), 555–567. https://doi.org/10.1080/10810730600829874.

Schulze, B. (2007). Stigma and mental health professionals: A review of the evidence on an intricate relationship. *International Review of Psychiatry, 19*(2), 137–155.

Seng, J. S., Lopez, W. D., Sperlich, M., Hamama, L., & Meldrum, C. D. R. (2012). Marginalized identities, discrimination burden, and mental health: Empirical exploration of an interpersonal-level approach to modeling intersectionality. *Social Science & Medicine, 75*(12), 2437–2445. https://doi.org/10.1016/j.socscimed.2012.09.023.

Shrivastava, A., Johnston, M., & Bureau, Y. (2012). Stigma of mental illness-1: Clinical reflections. *MSM, 10*(1), 70–84.

Shuler, K. M. (2014). Approaches to improve adherence to pharmacotherapy in patients with schizophrenia. *Patient Preference Adherence, 8*, 701–714.

Simien, E. (2007). Doing intersectionality research: From conceptual issues to practical examples. *Politics and Gender, 3*(2), 264–271.

Smith, S. G., Wolf, M. S., & von Wagner, C. (2010). Socioeconomic status, statistical confidence, and patient-provider communication: An analysis of the Health Information National Trends Survey (HINTS 2007). *Journal of Health Communication, 15*(Suppl 3), 169–185. https://doi.org/10.1080/10810730.2010.522690.

Socías, M. E., Koehoorn, M., & Shoveller, J. (2016). Gender inequalities in access to health care among adults living in British Columbia, Canada. *Women's Health Issues, 26*(1), 74–79. https://doi.org/10.1016/j.whi.2015.08.001.

Söderhamn, O. (1998). Self-care ability in a group of elderly Swedish people: A phenomenological study. *Journal of Advanced Nursing, 28*(4), 745–753.

Sorkin, D. H., Murphy, M., Nguyen, H., & Biegler, K. A. (2016). Barriers to mental health care for an ethnically and racially diverse sample of older adults. *Journal of the American Geriatric Society, 64*(10), 2138–2143.

Stern, S., Merwin, E., Hauenstein, E., Hinton, I., Rovnyak, V., Wilson, M., … Mahone, I. (2010). The effects of rurality on mental and physical health. *Health Services and Outcomes Research Methodology, 10*(1–2), 33–66. https://doi.org/10.1007/s10742-010-0062-2.

Stiffman, A. R., Pescosolido, B., & Cabassa, L. J. (2004). Building a model to understand youth service access: The Gateway Provider Model. *Mental Health Services Research, 6*(4), 189–198. https://doi.org/10.1023/b:mhsr.0000044745.09952.33.

Strachan, D. P. (1997). *A life course approach to chronic disease epidemiology*. Oxford: Oxford University Press.

Syed, S. T., Gerber, B. S., & Sharp, L. K. (2013). Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health, 38*(5), 976–993. https://doi.org/10.1007/s10900-013-9681-1.

Thomas, T. L., DiClemente, R., & Snell, S. (2014). Overcoming the triad of rural health disparities: How local culture, lack of economic opportunity, and geographic location instigate health disparities. *Health Education Journal, 73*(3), 285–294. https://doi.org/10.1177/0017896912471049.

Thongsai, S., Gray, R., & Bressington, D. (2016). The physical health of people with schizophrenia in Asia: Baseline findings from a physical health check programme. *Journal of Psychiatric and Mental Health Nursing, 23*(5), 255–266. https://doi.org/10.1111/jpm.12300.

Tsouroufli, M., Rees, C. E., Monrouxe, L. V., & Sundaram, V. (2011). Gender, identities and intersectionality in medical education research. *Medical Education, 45*(3), 213–216. https://doi.org/10.1111/j.1365-2923.2010.03908.x.

U. K. Department of Health (2002). *The social and economic circumstances of adults with mental disorders* (Report No. 0116215631). London: TSO. Retrieved from http://webarchive.nationalarchives.gov.uk/+/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_4081142.

van Hasselt, F. M., Oud, M. J. T., & Loonen, A. J. M. (2013). Improvement of care for the physical health of patients with Severe Mental Illness: A qualitative study assessing the view of patients and families. *BMC Health Services Research, 13*, 426–426. https://doi.org/10.1186/1472-6963-13-426.

Vedana, K. G. G., Silva, D. R. A., Miasso, A. I., Zanetti, A. C. G., & Borges, T. L. (2017). The meaning of stigma for people with mental disorders in Brazil. *Issues in Mental Health Nursing*. https://doi.org/10.1080/01612840.2017.1346013.

Veenstra, G. (2011). Race, gender, class, and sexual orientation: Intersecting axes of inequality and self-rated health in Canada. *International Journal for Equity in Health*. https://doi.org/10.1186/1475-9276-10-3.

Velligan, D. I., Roberts, D. L., Sierra, C., Fredrick, M. M., & Roach, M. J. (2016). What patients with severe mental illness transitioning from hospital to community have to say about care and shared decision-making. *Issues in Mental Health Nursing, 37*(6), 400–405. https://doi.org/10.3109/01612840.2015.1132289.

Velligan, D. I., Sajatovic, M., Hatch, A., Kramata, P., & Docherty, J. P. (2017). Why do psychiatric patients stop antipsychotic medication? A systematic review of reasons for nonadherence to medication in patients with serious mental illness. *Patient Preference and Adherence, 11*, 449–468. https://doi.org/10.2147/ppa.s124658.

Viron, M. J., & Stern, T. A. (2010). The impact of serious mental illness on health and healthcare. *Psychosomatics, 51*(6), 458–465.

Wadsworth, M. E. J. (1999). *Social determinants of health*. Oxford: Oxford University Press.

Walby, S. (2007). Complexity theory, systems theory, and multiple intersecting social inequalities. *Philosophy of the Social*

Sciences, 37(4), 449–470. https://doi.org/10.1177/0048393107307663.

Warner, D. F., & Brown, T. H. (2011). Understanding how race/ethnicity and gender define age-trajectories of disability: An intersectionality approach. *Social Science & Medicine, 72*(8), 1236–1248. https://doi.org/10.1016/j.socscimed.2011.02.034.

White, A. M., Philogene, G. S., Fine, L., & Sinha, S. (2009). Social support and self-reported health status of older adults in the United States. *American Journal of Public Health, 99*(10), 1872–1878. https://doi.org/10.2105/AJPH.2008.146894.

White, R. O., Chakkalakal, R. J., Presley, C. A., Bian, A., Schildcrout, J. S., Wallston, K. A., … Rothman, R. (2016). Perceptions of provider communication among vulnerable patients with diabetes: Influences of medical mistrust and health literacy. *Journal of Health Communication, 21*(sup2), 127–134. https://doi.org/10.1080/10810730.2016.1207116.

Whitson, H. E., Johnson, K. S., Sloane, R., Cigolle, C. T., Pieper, C. F., Landerman, L., & Hastings, S. N. (2016). Identifying patterns of multimorbidity in older Americans: Application of latent class analysis. *Journal of the American Geriatrics Society, 64*(8), 1668–1673. https://doi.org/10.1111/jgs.14201.

Winker, G., & Degele, N. (2011). Intersectionality as multi-level analysis: Dealing with social inequality. *European Journal of Womens Studies, 18*(1), 51–66. https://doi.org/10.1177/1350506810386084.

Winterton, R., & Warburton, J. (2011). Models of care for socially isolated older rural carers: Barriers and implications. *Rural and Remote Health, 11*(3), 1678.

Wright-Berryman, J. L., & Kim, H. W. (2016). Physical health decision-making autonomy preferences for adults with severe mental illness in integrated care. *Journal of Social Service Research, 42*(3), 281–294. https://doi.org/10.1080/01488376.2015.1093580.