HHS Public Access

Author manuscript

Am J Orthopsychiatry. Author manuscript; available in PMC 2021 January 01.

Published in final edited form as:

Am J Orthopsychiatry. 2020 ; 90(1): 90–97. doi:10.1037/ort0000399.

Community Participation Factors and Poor Neurocognitive Functioning among Persons with Schizophrenia

Elizabeth C. Thomas[a], **Gretchen Snethen**[b], **Mark S. Salzer**[c]

[a]Department of Rehabilitation Sciences, College of Public Health, Temple University, 1700 N Broad St., Philadelphia, Pennsylvania, 19121, USA

[b]Department of Rehabilitation Sciences, College of Public Health, Temple University, Philadelphia, Pennsylvania, 1700 N Broad St., Philadelphia, Pennsylvania, 19121, USA, gsnethen@temple.edu

[c]Department of Rehabilitation Sciences, College of Public Health, Temple University, Philadelphia, Pennsylvania, 1700 N Broad St., Philadelphia, Pennsylvania, 19121, USA, msalzer@temple.edu

Abstract

Poor neurocognitive functioning among individuals with schizophrenia is typically conceptualized as resulting from a disease process. The objective of this paper is to further expand understanding of poor neurocognition beyond pathogenesis toward a perspective that also incorporates community participation factors. This paper focuses on three such factors – sedentary behavior, loneliness, and poverty – that have been demonstrated to be related to neurocognition and are highly prevalent among individuals with schizophrenia. This paper provides an overview of the research on each factor and discusses its possible connection to neurocognitive challenges for individuals with schizophrenia. Implications for research, policy, and practice efforts are then proposed to broaden approaches to understanding and addressing neurocognitive challenges in this population.

Keywords

physical activity; sedentary behavior; loneliness; poverty; socio-environmental factors

Introduction

Researchers have long believed that poor neurocognitive functioning among those with schizophrenia is the result of an underlying disease process (Kraepelin, 1919; Bleuler, 1958; Kurtz, 2015). Put another way, neurocognitive deficits are manifestations of aberrant neurobiological mechanisms that are specific to those with psychosis. For example, neuroimaging studies have uncovered a number of structural brain abnormalities that are associated with poor neurocognitive functioning in this population (Hartberg et al., 2011;

Corresponding Author: Department of Rehabilitation Sciences, College of Public Health, Temple University, 1700 N Broad St., Philadelphia, Pennsylvania, 19121, USA, elizabeth.thomas@temple.edu, phone: +1-215-204-1699.

Disclosures: All authors declare that there are no financial conflicts of interest associated with this research.

Nestor et al., 2013), including white and gray matter decrements, enlarged ventricular size, and reduced brain volume in the frontal lobe (Heilbronner, Samara, Leucht, Falkai, & Schulze, 2016). Another large body of research has found preliminary evidence of connections between genes in the dopaminergic, neurotrophic, cell adhesion, serotonin, and sodium channel systems and specific neurocognitive deficits among those with schizophrenia (Zai, Robbins, Sahakian, & Kennedy, 2017). Neurocognitive impairment is so intertwined with illness-related ideologies that some have argued that it should be considered as a criterion for the diagnosis of schizophrenia itself (Keefe & Fenton, 2007).

More contemporary perspectives, driven by neuroscientific discoveries, have increasingly recognized the limitations of purely neurobiological or pathophysiological explanations for poor neurocognitive functioning among those with schizophrenia. For example, Weinberger (1987) proposed a neurodevelopmental model of schizophrenia, arguing that because structural and physiological pathology of the brain is typically apparent long before symptom onset, there must be a process by which aberrant biology interacts with normal brain maturation to produce impairments associated with the disorder. Spaulding et al. (2003) presented a biosystemic framework for understanding and treating psychopathology, integrating research findings across multiple levels of analysis (neurophysiological, neurocognitive, social cognitive, socio-behavioral, socio-environmental) to identify determinants of functioning and impairment. The ideologies of these models coalesce in more recent writings that stress the need to integrate disparate biological, developmental, psychological, and socio-environmental literatures for the purpose of developing comprehensive theories of schizophrenia (Silverstein et al., 2013).

Despite recognition of multiple causal and connected factors that contribute to poor neurocognition, the disease process perspective continues to drive current practices, which primarily focus on interventions targeting affected brain chemistry (Keefe, 2001) or training in compensatory strategies or cognitive remediation (Medalia & Choi, 2009). Efforts to identify pharmacological treatments for neurocognitive impairment have produced mixed results at best (Ferreira et al., 2016; Takeuchi, Thiyanavadivel, Fervaha, & Remington, 2017). And, although compensatory and remediation approaches have been shown to produce statistically significant gains in performance-based functional outcomes, they remain limited in terms of their broad-based impact in the absence of other psychiatric rehabilitation (Wykes, Huddy, Cellard, McGurk, & Czobor, 2011).

This paper considers how lack of community participation and three specific sequelae – sedentary behavior, loneliness, and poverty – might contribute to poor neurocognitive functioning. As such, it is intended to further expand understanding of poor neurocognition beyond pathogenesis. The purpose is not to provide a comprehensive synthesis of all factors that have associations with neurocognition, but to support the field in recognizing that neurocognitive differences among those with schizophrenia are likely not solely the result of a disease process. The approach of this paper is consistent with contemporary models of schizophrenia that challenge reductionism [e.g., (Spaulding et al., 2003)] by clarifying how specific aspects of the social environment may interact with behavioral, psychological, and biological processes to impact neurocognition. A more biosystemic informed approach will likely expand targets for intervention to impact neurocognitive functioning.

Community Participation Factors and Poor Neurocognitive Functioning

Community participation refers to activities in areas such as work, school, social and family relationships, leisure, or religion, that enable individuals to fulfill valued roles (Burns-Lynch, Brusilovskiy, & Salzer, 2016). Sedentary behavior, loneliness, and poverty are consequences of lack of community participation, are related to neurocognition, and are highly prevalent issues among individuals with schizophrenia (Badcock et al., 2015; Pratt, 2012; Stubbs, Williams, Gaughran, & Craig, 2016). In fact, physical health concerns, loneliness, and financial problems are among the highest-ranked challenges reported by people with psychotic disorders (Morgan et al., 2012). Community participation, broadly-speaking, provides opportunity for incidental physical activity engagement (reducing sedentary behavior) (Suetani et al., 2016), enables individuals to develop social connections and a sense of belonging (decreasing loneliness) (Iwasaki et al., 2014), and fosters the building of social capital, thereby increasing access to employment and other resources needed to impact finances (and ameliorating poverty) (Portes, 1998). While some of these factors may be influenced in the absence of community participation (e.g., physical activity may occur within the confines of one's home), each is exacerbated by the fact that individuals with schizophrenia have disproportionately fewer opportunities for full and personally meaningful participation in settings of their choosing (Salzer, Baron, Menkir, & Breen, 2014).

Physical activity / sedentary behavior.—According to the World Health Organization (2017), physical activity includes exercise and other forms of bodily movement that are performed in the context of daily living activities (i.e., recreation, work, active transportation, home maintenance). Greater levels of physical activity have been associated with brain plasticity, such as greater hippocampal and basal ganglia volume, brain connectivity, prefrontal cortex volume, and white matter integrity, and elevated and more efficient patterns of brain activity (Erickson, Hillman, & Kramer, 2015). Physical activity is also associated with enhanced neurotrophic factor signaling, which is related to cognitive functioning (Phillips, Baktir, Srivatsan, & Salehi, 2014). Research suggests that older adults who participate in at least 26 minutes of moderate physical activity per day demonstrate less age-related cognitive decline in the pre-frontal cortex (Kimura, Yasunaga, & Wang, 2013). Robustness of current findings has led to the conclusion that "physical activity beneficially influences brain function during adulthood, particularly frontal lobe-mediated cognitive processes, such as planning, scheduling, inhibition, and working memory" (Ratey & Loehr, 2011, p. 171).

Sedentary behavior constitutes engagement in activity where an individual is in a seated or reclined position and movement is less than 1.5 metabolic equivalents (METs) (Tremblay et al., 2017). Individuals with schizophrenia spend greater amounts of time in sedentary behavior than the general population (Stubbs et al., 2016). In fact, individuals diagnosed with schizophrenia spend upwards of 22 hours per week day in sedentary behavior, including sleep (Roick et al., 2007). A study measuring sedentary behavior with an ActiGraph accelerometer found that individuals with schizophrenia who were overweight averaged 15 hours of accelerometer wear-time, of which 13 was sedentary, constituting 81% of time spent in sedentary activity. In comparison, 62% of accelerometer wear-time was

spent in sedentary activity in a sample of overweight, non-diagnosed individuals (Janney et al., 2015). A study of 199 individuals with schizophrenia and 60 age matched controls found individuals with schizophrenia engaged in an average of 4 hours and 7 minutes more of daily sedentary behavior than control participants (Stubbs, Ku, Chung, & Chen, 2017).

Among individuals with schizophrenia, higher levels of sedentary behavior appear to be associated with lower motor reaction time, and low levels of overall physical activity are independently associated with worse attention, concentration, and poorer processing speeds (Stubbs et al., 2017). High levels of sedentary behavior also contribute to poor aerobic fitness (Kimhy et al., 2014; Vancampfort et al., 2013; Vancampfort et al., 2011), which is significantly and positively associated with neurocognition (Kimhy et al., 2014). Specific areas associated with aerobic fitness include processing speed, working memory, problem solving, and social cognition (Kimhy et al., 2014; Vancampfort et al., 2015).

While not synonymous with reduced time in sedentary behavior, exercise interventions, when implemented with individuals diagnosed with schizophrenia spectrum disorders, appear to have a beneficial effect on neurocognitive functioning. In a meta-analysis, the effect size of exercise interventions was .43, which is comparable to the effect size of cognitive remediation therapy (Firth et al., 2017). Aerobic exercise has also been shown to potentiate the effects of cognitive remediation (Nuechterlein et al., 2016). Specific areas of neurocognition that appear to be most impacted by exercise include working memory, attention and vigilance, and social cognition (Firth et al., 2017).

While evidence demonstrates a clear relationship between sedentary behavior and neurocognition and the potential for physical activity to improve neurocognitive functioning among adults with schizophrenia, additional research is needed in this area. Studies have been limited by cross-sectional designs and inconsistent measurement and analysis of physical activity, suggesting a need for further research designed to test assumptions about directionality and provide more precise estimates of the prevalence and impact of sedentary behavior. Additional intervention research, particularly regarding effects on neurocognitive outcomes, is also needed. As a starting point, ten physical activity research questions in schizophrenia have been identified. Of particular importance to this topic are “How can we prevent sedentary behavior in people with schizophrenia?; How do we translate physical activity research into clinical and community practice?; What are the key barriers for engaging people with schizophrenia in physical activity?” (Vancampfort et al., 2016, p. 2237). These research questions provide a platform for better understanding community participation factors that influence levels of sedentary behavior and engagement in physical activity, and how these relate to neurocognition. For example, researchers could explore the socio-environmental factors that may influence different levels of engagement in physical activity (i.e., sedentary, light, moderate, vigorous) and the association of these different levels of engagement with neurocognition.

Loneliness.—Loneliness is a subjective feeling of being set apart from, misunderstood, or rejected by other people, or a lack of satisfaction with social relationships (Andersson, 1998). It is a construct distinct from social isolation, in that those who have ample social networks with frequent contacts may still experience loneliness (Cornwell & Waite, 2009).

Loneliness is related to various domains of neurocognition in the general population, including global cognition, psychomotor processing speed, visual memory, and immediate and delayed recall (Ayalon, Shiovitz-Ezra, & Roziner, 2016; O'Luanaigh et al., 2012; Shankar, Hamer, McMunn, & Steptoe, 2013). Several hypotheses about the role of loneliness in explaining neurocognitive decline have been suggested (Ayalon et al., 2016). Cacioppo and Hawkley (2009) posit that lack of social engagement reduces opportunities to be involved in complex interpersonal exchanges and stimulating environments, which weakens neurocognition. Conversely, Berkman et al. (2000) suggest that participation in social relationships allows one to both give and receive support, which enhances neurocognitive functioning. Other researchers suggest that loneliness increases stress, which decreases neurocognitive capacity (Ayalon et al., 2016). Corroborating this hypothesis are findings that the same biological processes that are part of the stress response are also linked to loneliness and neurocognition. Specifically, according to Boss and colleagues (2015), prolonged activation of the hypothalamus-pituitary-adrenal (HPA) axis and hypercortisolism demonstrate a relationship with loneliness (Adam, Hawkley, Kudielka, & Cacioppo, 2006; Dallman et al., 2004; Steptoe, Owen, Kunz-Ebrecht, & Brydon, 2004), and poor performance in various neurocognitive domains (Adam et al., 2006; Beluche, Carrière, Ritchie, & Ancelin, 2010; Fiocco, Wan, Weekes, Pim, & Lupien, 2006; Peavy et al., 2009; Steptoe et al., 2004). Individuals who are lonely are also more reactive to stress (Boss et al., 2015).

Loneliness is a prevalent problem among those with schizophrenia. In a study of 7,451 community-dwelling individuals aged 16 years and over, those with a psychotic disorder experienced greater loneliness than those who did not experience psychosis (Meltzer et al., 2013). Another study found that 80 percent of participants with schizophrenia spectrum disorders reported feeling lonely, a proportion that was significantly greater than that reported by members of the general population (Badcock et al., 2015). Among the possible explanations for increased loneliness among individuals with schizophrenia are community inclusion and participation obstacles, such as limited opportunity for social inclusion, public stigma of mental illness, and social distancing behavior (Davidson et al., 2004; Stier & Hinshaw, 2007).

Very little research has directly evaluated the relationship between loneliness and neurocognition among those with schizophrenia. A recent study found that, after controlling for demographic variables, loneliness was a significant predictor of neurocognition (i.e., coding performance), with those who reported feeling socially isolated or lonely having significantly poorer coding performance than those who reported feeling lonely only occasionally (Badcock et al., 2015). While not specifically focused on loneliness, two related studies suggest a positive relationship between neurocognition and exposure to social interaction and satisfaction with social support (Alptekin et al., 2005; Caplan, Schutt, Turner, Goldfinger, & Seidman, 2006).

Given the small evidence base, additional research on the relationship between loneliness and neurocognition among those with schizophrenia is needed. Longitudinal studies using psychometrically sound measures of loneliness, such as the University of California, Los Angeles (UCLA) Loneliness Scale (Russell, 1996), are necessary to better understand the

nature of the relationship. This is a promising future direction for the literature on neurocognition in schizophrenia given substantial findings in the general population.

Poverty.—While it is well-recognized that correlates of poverty[1] (e.g., environmental toxin exposure, poor nutrition) are associated with neurological functioning (Calderón-Garcidueñas et al., 2011; Calderón-Garcidueñas et al., 2012; D'Angiulli, Lipina, & Olesinska, 2012; Freire et al., 2010; Jackson, 2015), the experience of poverty itself may be directly related to neurocognition. Under conditions of economic scarcity, preoccupation with poverty-related concerns may reduce neurocognitive capacity, particularly in the areas of attention, short-term memory, and executive control (Gennetian & Shafir, 2015). In an experimental study of the neurocognitive functioning of sugarcane farmers, Mani and colleagues (2013) found that neurocognition was poorer before harvest when farmers were experiencing financial strain, compared to after harvest when they had greater wealth. Differences in neurocognition were not explained by time available, nutrition, work effort, or level of stress. Studies also support a causal effect of poverty on negative affect and stress, which in turn adversely impact decision-making (Haushofer & Fehr, 2014). Additionally, research suggests a direct relationship between poverty and neurocognitive development. For example, compared to their more advantaged counterparts, children from low socioeconomic status backgrounds demonstrate differences in reward processing, potentially due to low or inconsistent levels of reinforcement, which may impact cognitive flexibility (D'Angiulli et al., 2012). Yet, poverty appears to be a consistent correlate of neurocognition across the lifespan, as evidenced by a study showing that the present economic status of adults over the age of 60 was uniquely associated with processing speed even after controlling for an indicator of childhood socioeconomic status (Zhang et al., 2015).

Individuals with schizophrenia and other serious mental illnesses are more likely than the general population to experience poverty and homelessness (Pratt, 2012). In fact, it has been proposed that experiencing poverty may be a risk factor for developing psychosis (Read, 2010). Indeed, a recent study found that poverty during childhood demonstrated more associations with psychotic symptoms later in life than other forms of childhood adversity that confer risk for psychosis, such as abuse and neglect (Longden, Sampson, & Read, 2016). Similarly, exposure to poverty may exacerbate psychiatric symptoms, leading to increased hospitalization rates (Fortney, Xu, & Dong, 2009).

Despite findings about prevalence, poverty-related issues have been largely neglected in the literature on neurocognition and schizophrenia. Meta-analyses comparing the neurocognitive functioning of individuals with schizophrenia to participants in a control condition have been unable to adjust for the effects of variables such as socioeconomic status given the small number of studies that report this information (Bora & Murray, 2014; De Herdt et al., 2013; Mesholam-Gately, Giuliano, Goff, Faraone, & Seidman, 2009; Wang et al., 2009). Although the need to examine and account for sociodemographic variables is beginning to be recognized (Galderisi et al., 2014; Mollon et al., 2016), the manner in which these have

[1]While definitions of poverty vary, many research studies, including those cited in this paper, use indicators of socioeconomic status (i.e., household income, occupational class) as a proxy for the poverty construct. Regardless of the definition, research has demonstrated a consistent relationship between poverty and neurocognition.

been measured has been inconsistent across studies. This is not a problem inherent to the schizophrenia literature, but a pervasive one in poverty research (D'Angiulli et al., 2012). Mollon and colleagues (2016), who operationalized socioeconomic status according to participants' occupational class (e.g., professional vs. unskilled), found that when controlling for this variable, individuals with psychotic experiences had significantly poorer verbal knowledge and working and visual memory, but not processing speed, than those without psychotic experiences. In one of the most comprehensive analyses of predictors of functional outcome to date, Galderisi et al. (2014) examined the effects of 'illness-related factors' (including neuro- and social cognition), 'personal resources' (personal resiliency, service engagement) and 'context-related factors' (including socioeconomic status) among 921 individuals with schizophrenia. Socioeconomic status, which was operationalized according to parental education level and parental type of work, was not related to functional outcomes. The authors did not report whether it was related to neurocognition. Thus, future steps for research on the effect of poverty in schizophrenia are establishment of a reliable operationalization of this construct, and more systematic examination of its relationship with neurocognition.

Implications

Additional research is needed in order to answer important questions about poor neurocognitive functioning among individuals with schizophrenia. First and foremost is a need for research that accounts for community participation, and its sequelae, when evaluating neurocognition. A starting point might be to strengthen understanding of the pathways and mechanisms by which sedentary behavior, loneliness, and poverty affect neurocognitive outcomes. Other research could examine the effects of additional community participation-related factors not included in this paper that demonstrate impacts on neurocognition in other populations, such as educational attainment (Kabuba et al., 2018) and leisure participation (Lee et al., 2014). Second, these community participation factors are likely to be interrelated; for example, financial concerns are a reported barrier to social relationships (Topor, Ljungqvist, & Strandberg, 2016). Controlled studies are needed to isolate the effects of each. An especially important question is whether social interactions during group-based exercise account for variance explained in neurocognition; this question has not been addressed by current meta-analyses of exercise interventions for those with schizophrenia (Dauwan, Begemann, Heringa, & Sommer, 2016; Firth et al., 2017). A related issue is the need to establish the directionality of relationships. While there is compelling evidence that sedentary behavior, loneliness, and poverty impact neurocognition in the general population, the possibility cannot yet be ruled out that poorer neurocognition among those with schizophrenia leads to increases in each. As reflected by findings discussed in the present paper, the majority of the evidence is cross-sectional and correlational in nature. Longitudinal research could build upon these findings to clarify causal relationships. Finally, there is a need to more fully examine the relationship between neurocognition and functional outcomes after accounting for these community participation factors. It is possible that the relationship is spurious, or at least less robust than what is indicated by the current literature, due to factors that explain variance in both. Taken together, research in these areas would further advance comprehensive theory development and facilitate the formation of

multifaceted interventions to enhance neurocognitive functioning that are plausibly more effective.

Current findings, especially if corroborated by research that addresses the aforementioned needs, point towards some possible recommendations for policy and practice. A more concerted focus on promoting community participation offers promise for improving neurocognitive functioning and performance-based functional outcomes. Here, we offer some guiding principles for intervention efforts.

First, interventions that focus on increasing community participation should address personal obstacles that may impede participation, including psychiatric symptoms, skills deficits, and lack of supports. Providers can incorporate evidence-based practices that target these barriers, such as cognitive behavioral therapy and social skills training, into larger efforts to promote active involvement in the community. However, the amelioration of these obstacles should not be viewed as a pre-requisite to participation. Intervention models that emphasize rapid engagement in community-based activities, such as the Individual Placement and Support model of supported employment, have been shown to diminish the impact of personal obstacles (i.e., limited work history, neurocognitive impairments, psychiatric symptoms) on functional outcomes (Metcalfe, Drake, & Bond, 2017; McGurk & Mueser, 2004). These findings suggest that with the proper supports in place, individuals can participate in their communities and derive benefit from their participation even in the face of personal challenges.

Second, interventions should target not only personal obstacles but environmental barriers, such as discrimination, disempowering practices that undermine individual choice and autonomy, and poverty (Salzer et al., 2014). This dual, person-environment focus necessitates a collective effort between advocates, policy makers, providers, and people in recovery and their loved ones, and requires interventions that extend beyond person-level approaches. For example, individuals can work together to reform anti-discrimination laws, create educational campaigns to reduce public stigma, change institutional practices to enhance consumers' involvement in decision-making, and improve employment outcomes in mental health and psychiatric rehabilitation programs in order to reduce environmental barriers to participation (Salzer et al., 2014).

Applying a community integration perspective to the three factors that have been discussed allows for illustration of how maximizing opportunities for community participation can potentially address sedentary behavior, loneliness, and poverty and also lead to improvement in neurocognition and performance-based functional outcomes. First, physical activity could be enhanced by increasing opportunities for individuals with schizophrenia to participate meaningfully in the community. Psychiatric rehabilitation providers and other supporters can assist these individuals with identifying areas of community participation that are most important to them, connecting them with community-based resources to pursue their participation interests (e.g., mainstream recreation centers versus mental health program-based leisure opportunities), and providing advocacy and education regarding how to make community spaces as welcoming and inclusive as possible. As individuals experience greater physical activity, displacing sedentary behavior, neurocognition is likely to improve.

Simultaneously, individuals may develop or hone skills needed for successful community living, thereby enhancing performance-based functional outcomes.

Second, as loneliness may be tied to social marginalization, it follows that efforts to educate the community about schizophrenia and to enhance opportunities for interaction between people with and without mental health conditions would reduce feelings of being separate from, misunderstood, or rejected by others. As individuals perceive that they are part of their communities, they are likely to participate more fully (Prince & Prince, 2002). Consistent with the literature on the relationship between loneliness and neurocognition, greater exposure to interpersonal exchanges and stimulating environments is expected to increase neurocognitive functioning and enhance social functioning skills. Alternatively, greater access to social support through community participation would provide a buffer against stress, strengthening neurocognitive resources.

Poverty among individuals with schizophrenia, although affected by a host of factors, is undoubtedly tied to the high rate of unemployment in this population. Baron and Salzer (2002) comment on several typically cited reasons for this phenomenon – interference caused by psychiatric symptoms, ineffective or inaccessible vocational rehabilitation programs, and public disability policy that fosters dependency and discourages the pursuit of work. Of particular relevance to this discussion, these authors identify a fourth factor – labor market liabilities, such as female gender, ethnic minority status, low educational attainment, and restricted social networks, that limit the types of jobs that people can obtain, the salaries and benefits that they can access, and the job tenure that they can maintain. As many individuals with schizophrenia come from socially disadvantaged backgrounds already and experience these labor market liabilities, they do not have the same employment opportunities that support financial independence and prosperity as their more advantaged counterparts. According to recommendations by Baron and Salzer (2002), policy efforts might focus on increasing compliance with the Americans with Disabilities Act and creating workforce development policies that support the financial independence of workers without advanced degrees. Additionally, calls for changes within the entitlement system stress a need for gradual transition off disability and achievement of economic self-sufficiency (Henry & Lucca, 2004). Programs and practices, such as supported education and employment or vocational rehabilitation, might concentrate on helping individuals to pursue a college education or tailoring training to the labor market (Baron & Salzer, 2002). Services and supports should be designed to require minimal neurocognitive resources from participants in order to facilitate uptake, engagement, and follow-through (Gennetian & Shafir, 2015). With greater access to employment and improved financial circumstances, individuals could live with fewer finance-related stressors, which is expected to improve neurocognition. Greater participation in work-related activities would likely also enhance job performance.

Conclusion

Sedentary behavior, loneliness, and poverty are all prevalent issues that affect individuals with schizophrenia, and each is linked to poor neurocognitive functioning. These community participation factors and their relationship with neurocognition have received relatively little attention in the schizophrenia literature. This paper is intended to inspire additional research

in this area, and further encourage policy and practice efforts designed to enhance community participation.

Acknowledgments

The contents of this paper were developed with the assistance of grant H133B100037 from the National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR) and grant K08MH116101 from the National Institute of Mental Health (NIMH). However, the contents do not necessarily represent the policy of the U.S. Department of Health and Human Services or the official views of the National Institutes of Health, and endorsement by the Federal government should not be assumed.

References

Adam E, Hawkley L, Kudielka B, & Cacioppo J (2006). Day-to-day dynamics of experience-cortisol associations in a population-based cohort of older adults. Proceedings of the National Academy of Sciences USA, 103, 17058–17063. doi: 10.1073/pnas.0605053103

Alptekin K, Akvardar Y, Akdede BBK, Dumlu K, Işik D, Pirinçci F, et al. (2005). Is quality of life associated with cognitive impairment in schizophrenia? Progress in Neuro-Psychopharmacology & Biological Psychiatry, 29(2), 239–244. doi: 10.1016/j.pnpbp.2004.11.006 [PubMed: 15694230]

Andersson L (1998). Loneliness research and interventions: A review of the literature. Aging & Mental Health, 2(4), 264–274. doi: 10.1080/13607869856506

Ayalon L, Shiovitz-Ezra S, & Roziner I (2016). A cross-lagged model of the reciprocal associations of loneliness and memory functioning. Psychology and Aging, 31(3), 255–261. doi: 10.1037/pag0000075 [PubMed: 26974589]

Badcock JC, Shah S, Mackinnon A, Stain HJ, Galletly C, Jablensky A, et al. (2015). Loneliness in psychotic disorders and its association with cognitive function and symptom profile. Schizophrenia Research, 169(1–3), 268–273. doi: 10.1016/j.schres.2015.10.027 [PubMed: 26527247]

Baron RC, & Salzer MS (2002). Accounting for unemployment among people with mental illness. Behavioral Sciences & the Law, 20(6), 585–599. doi: 10.1002/bsl.513 [PubMed: 12465129]

Beluche I, Carrière I, Ritchie K, & Ancelin ML (2010). A prospective study of diurnal cortisol and cognitive function in community-dwelling elderly people. Psychological Medicine, 40(6), 1039–1049. doi: 10.1017/S0033291709991103 [PubMed: 19814852]

Berkman LF, Glass T, Brissette I, & Seeman TE (2000). From social integration to health: Durkheim in the new millennium. Social Science & Medicine, 51(6), 843–857. doi: 10.1016/S0277-9536(00)00065-4 [PubMed: 10972429]

Bleuler E (1958). Dementia praecox or the group of schizophrenias New York, New York: International Universities Press.

Bora E, & Murray RM (2014). Meta-analysis of cognitive deficits in ultra-high risk to psychosis and first-episode psychosis: Do the cognitive deficits progress over, or after, the onset of psychosis? Schizophrenia Bulletin, 40(4), 744–755. doi: 10.1093/schbul/sbt085 [PubMed: 23770934]

Boss L, Kang D-H, & Branson S (2015). Loneliness and cognitive function in the older adult: A systematic review. International Psychogeriatrics, 27(4), 541–553. doi: 10.1017/S1041610214002749 [PubMed: 25554219]

Burns-Lynch B, Brusilovskiy E, & Salzer MS (2016). An empirical study of the relationship between community participation, recovery, and quality of life of individuals with serious mental illnesses. Israel Journal of Psychiatry and Related Sciences, 53(1), 46–55. [PubMed: 28856880]

Cacioppo JT, & Hawkley LC Perceived social isolation and cognition. Trends in Cognitive Sciences, 13(10), 447–454. doi: 10.1016/j.tics.2009.06.005

Calderón-Garcidueñas L, Engle R, Mora-Tiscareño A, Styner M, Gómez-Garza G, Zhu H, et al. (2011). Exposure to severe urban air pollution influences cognitive outcomes, brain volume and systemic inflammation in clinically healthy children. Brain and Cognition, 77(3), 345–355. doi: 10.1016/j.bandc.2011.09.006 [PubMed: 22032805]

Calderón-Garcidueñas L, Mora-Tiscareño A, Styner M, Gómez-garza G, Zhu H, Torres-Jardón R, et al. (2012). White matter hyperintensities, systemic inflammation, brain growth, and cognitive

functions in children exposed to air pollution. Journal of Alzheimer's Disease, 31(1), 183–191. doi: 10.3233/JAD-2012-120610

Caplan B, Schutt RK, Turner WM, Goldfinger SM, & Seidman LJ (2006). Change in neurocognition by housing type and substance abuse among formerly homeless seriously mentally ill persons. Schizophrenia Research, 83(1), 77–86. doi: 10.1016/j.schres.2005.11.013 [PubMed: 16504484]

Cornwell EY, & Waite LJ (2009). Measuring social isolation among older adults using multiple indicators from the nshap study. The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 64(Suppl 1), I38–I46. doi: 10.1093/geronb/gbp037

D'Angiulli A, Lipina SJ, & Olesinska A (2012). Explicit and implicit issues in the developmental cognitive neuroscience of social inequality. Frontiers in Human Neuroscience, 6. doi: 10.3389/fnhum.2012.00254

Dallman M, La Fleur S, Pecoraro N, Gomez F, Houshyar M, & Akana S (2004). Mini review: Glucocorticoids-food intake, abdominal obesity, and wealthy nations of 2004. Endocrinology, 145, 2633–2638. doi: 10.1210/en.2004-0037 [PubMed: 15044359]

Dauwan M, Begemann MJH, Heringa SM, & Sommer IE (2016). Exercise improves clinical symptoms, quality of life, global functioning, and depression in schizophrenia: A systematic review and meta-analysis. Schizophrenia Bulletin, 42(3), 588–599. doi: 10.1093/schbul/sbv164 [PubMed: 26547223]

Davidson L, Shahar G, Stayner DA, Chinman MJ, Rakfeldt J, & Tebes JK (2004). Supported socialization for people with psychiatric disabilities: Lessons from a randomized controlled trial. Journal of Community Psychology, 32(4), 453–477. doi: 10.1002/jcop.20013

De Herdt A, Wampers M, Vancampfort D, De Hert M, Vanhees L, Demunter H, et al. (2013). Neurocognition in clinical high risk young adults who did or did not convert to a first schizophrenic psychosis: A meta-analysis. Schizophrenia Research, 149(1–3), 48–55. doi: 10.1016/j.schres.2013.06.017 [PubMed: 23830855]

Erickson KI, Hillman CH, & Kramer AF (2015). Physical activity, brain, and cognition. Current Opinion in Behavioral Sciences, 4, 27–32. doi: 10.1016/j.cobeha.2015.01.005

Ferreira CD, de Souza MGD, Fernández-Calvo B, Machado-de-Sousa JP, Cecilio Hallak JE, & Torro-Alves N (2016). Neurocognitive functions in schizophrenia: A systematic review of the effects of typical and atypical antipsychotic drugs. Psychology & Neuroscience, 9(1), 12–31. doi: 10.1037/pne0000045

Fiocco AJ, Wan N, Weekes N, Pim H, & Lupien SJ (2006). Diurnal cycle of salivary cortisol in older adult men and women with subjective complaints of memory deficits and/or depressive symptoms: Relation to cognitive functioning. Stress, 9(3), 143–152. doi: 10.1080/10253890600965674 [PubMed: 17060048]

Firth J, Stubbs B, Rosenbaum S, Vancampfort D, Malchow B, Schuch F, et al. (2017). Aerobic exercise improves cognitive functioning in people with schizophrenia: A systematic review and meta-analysis. Schizophrenia Bulletin, 43(3), 546–556. doi: 10.1093/schbul/sbw115 [PubMed: 27521348]

Fortney JC, Xu S, & Dong F (2009). Community-level correlates of hospitalizations for persons with schizophrenia. Psychiatric Services, 60(6), 772–778. doi: 10.1176/appi.ps.60.6.772 [PubMed: 19487346]

Freire C, Ramos R, Puertas R, Lopez-Espinosa M-J, Julvez J, Aguilera I, et al. (2010). Association of traffic-related air pollution with cognitive development in children. Journal of Epidemiology and Community Health, 64(3), 223–228. doi: 10.1136/jech.2008.084574 [PubMed: 19679705]

Galderisi S, Rossi A, Rocca P, Bertolino A, Mucci A, Bucci P, et al. (2014). The influence of illness-related variables, personal resources and context-related factors on real-life functioning of people with schizophrenia. World Psychiatry, 13(3), 275–287. doi: 10.1002/wps.20167 [PubMed: 25273301]

Gennetian LA, & Shafir E (2015). The persistence of poverty in the context of financial instability: A behavioral perspective. Journal of Policy Analysis and Management, 34(4), 904–936. doi: 10.1002/pam.21854

Hartberg CB, Sundet K, Rimol LM, Haukvik UK, Lange EH, Nesvåg R, et al. (2011). Subcortical brain volumes relate to neurocognition in schizophrenia and bipolar disorder and healthy controls.

Progress in Neuro-Psychopharmacology & Biological Psychiatry, 35(4), 1122–1130. doi: 10.1016/j.pnpbp.2011.03.014 [PubMed: 21457744]

Haushofer J, & Fehr E (2014). On the psychology of poverty. Science, 344(6186), 862–867. doi: 10.1126/science.1232491 [PubMed: 24855262]

Heilbronner U, Samara M, Leucht S, Falkai P, & Schulze TG (2016). The longitudinal course of schizophrenia across the lifespan: Clinical, cognitive, and neurobiological aspects. Harvard Review of Psychiatry, 24(2), 118–128. doi: 10.1097/HRP.0000000000000092 [PubMed: 26954596]

Henry AD, & Lucca AM (2004). Facilitators and barriers to employment: The perspectives of people with psychiatric disabilities and employment service providers. Work: Journal of Prevention, Assessment & Rehabilitation, 22(3), 169–182. doi: 10.1080/16549716.2018.1463658

Iwasaki Y, Coyle C, Shank J, Messina E, Porter H, Salzer M, et al. (2014). Role of leisure in recovery from mental illness. American Journal of Psychiatric Rehabilitation, 17(2), 147–165. doi: 10.1080/15487768.2014.909683

Jackson MI (2015). Early childhood wic participation, cognitive development and academic achievement. Social Science & Medicine, 126, 145–153. doi: 10.1016/j.socscimed.2014.12.018 [PubMed: 25555255]

Janney CA, Ganguli R, Tang G, Cauley JA, Holleman RG, Richardson CR, et al. (2015). Physical activity and sedentary behavior measured objectively and subjectively in overweight and obese adults with schizophrenia or schizoaffective disorders. Journal of Clinical Psychiatry, 76(10), E1277–E1284. doi: 10.4088/JCP.14m09330 [PubMed: 26528650]

Kabuba N, Menon JA, Franklin DR, Lydersen S, Heaton RK, Hestad KA (2018). Effect of age and level of education on neurocognitive impairment in HIV positive Zambian adults. Neuropsychology, 32(5), 519–528. doi: 10.1037/neu0000438.supp [PubMed: 29504779]

Keefe RSE (2001). Neurocognition. In Breier A, Tran PV, Herrera JM, Tollefson GD & Bymaster FP (Eds.), Current issues in the psychopharmacology of schizophrenia (pp. 192–205). Philadelphia, PA: Lippincott Williams & Wilkins Publishers.

Keefe RS, & Fenton WS (2007). How should DSM-V criteria for schizophrenia include cognitive impairment? Schizophrenia Bulletin, 33(4), 912–920. doi: 10.1093/schbul/sbm046 [PubMed: 17567627]

Kimhy D, Vakhrusheva J, Bartels MN, Armstrong HF, Ballon JS, Khan S, et al. (2014). Aerobic fitness and body mass index in individuals with schizophrenia: Implications for neurocognition and daily functioning. Psychiatry Research, 220(3), 784–791. doi: 10.1016/j.psychres.2014.08.052 [PubMed: 25219618]

Kimura K, Yasunaga A, & Wang L-Q (2013). Correlation between moderate daily physical activity and neurocognitive variability in healthy elderly people. Archives of Gerontology and Geriatrics, 56(1), 109–117. doi: 10.1016/j.archger.2012.10.004 [PubMed: 23137935]

Kraepelin E (1919). 1971 (facsimile 1919 edition). Dementia Praecox and Paraphrenia Huntington, NY: Robert E. Krieger Publishing Co.

Kurtz MM (2015). Neurocognition in schizophrenia: A core illness feature and novel treatment target. In Mohlman J, Deckersbach T & Weissman AS (Eds.), From symptom to synapse: A neurocognitive perspective on clinical psychology (pp. 182–210). New York, NY, US: Routledge/Taylor & Francis Group.

Lee T, Lipnicki DM, Crawford JD, Henry JD, Trollor JN, Ames D, et al. (2014). Leisure activity, health, and medical correlates of neurocognitive performance among monozygotic twins: the older Australian twins study. The Journals of Gerontology: Series B, 69(4), 514–522. doi: 10.1093/geronb/gbt031

Longden E, Sampson M, & Read J (2016). Childhood adversity and psychosis: Generalised or specific effects? Epidemiology and Psychiatric Sciences, 25(4), 349–359. doi: 10.1017/S204579601500044X [PubMed: 26156083]

Mani A, Mullainathan S, Shafir E, & Zhao J (2013). Poverty impedes cognitive function. Science, 341(6149), 976–980. doi: 10.1126/science.1238041 [PubMed: 23990553]

McGurk SR, & Mueser KT (2004). Cognitive functioning, symptoms, and work in supported employment: a review and heuristic model. Schizophrenia Research, 70(2–3),147–173. doi: 10.1016/j.schres.2004.01.009 [PubMed: 15329293]

Medalia A, & Choi J (2009). Cognitive remediation in schizophrenia. Neuropsychology Review, 19(3), 353–364. doi: 10.1007/s11065-009-9097-y [PubMed: 19444614]

Meltzer H, Bebbington P, Dennis MS, Jenkins R, McManus S, & Brugha TS (2013). Feelings of loneliness among adults with mental disorder. Social Psychiatry and Psychiatric Epidemiology, 48(1), 5–13. doi: 10.1007/s00127-012-0515-8 [PubMed: 22570258]

Mesholam-Gately RI, Giuliano AJ, Goff KP, Faraone SV, & Seidman LJ (2009). Neurocognition in first-episode schizophrenia: A meta-analytic review. Neuropsychology, 23(3), 315–336. doi: 10.1037/a0014708 [PubMed: 19413446]

Metcalfe JD, Drake RE, & Bond GR (2017). Predicting employment in the mental health treatment study: do client factors matter? Administration and Policy in Mental Health and Mental Health Services Research, 44(3), 345–353. doi: 10.1007/s10488-016-0774-x [PubMed: 27853950]

Mollon J, David AS, Morgan C, Frissa S, Glahn D, Pilecka I, et al. (2016). Psychotic experiences and neuropsychological functioning in a population-based sample. JAMA Psychiatry, 73(2), 129–138. doi: 10.1001/jamapsychiatry.2015.2551 [PubMed: 26720073]

Morgan VA, Waterreus A, Jablensky A, Mackinnon A, McGrath JJ, Carr V, et al. (2012). People living with psychotic illness in 2010: The second australian national survey of psychosis. Australian & New Zealand Journal of Psychiatry, 46(8), 735–752. doi: 10.1177/0004867412449877 [PubMed: 22696547]

Nestor PG, Kubicki M, Nakamura M, Niznikiewicz M, Levitt JJ, Shenton ME, et al. (2013). Neuropsychological variability, symptoms, and brain imaging in chronic schizophrenia. Brain Imaging and Behavior, 7(1), 68–76. doi: 10.1007/s11682-012-9193-0 [PubMed: 23011383]

Nuechterlein KH, Ventura J, McEwen SC, Gretchen-Doorly D, Vinogradov S, & Subotnik KL (2016). Enhancing cognitive training through aerobic exercise after a first schizophrenia episode: Theoretical conception and pilot study. Schizophrenia Bulletin, 42(suppl_1), S44–S52. doi: 10.1093/schbul/sbw007 [PubMed: 27460618]

O'Luanaigh C, O'Connell H, Chin AV, Hamilton F, Coen R, Walsh C, et al. (2012). Loneliness and cognition in older people: The dublin healthy ageing study. Aging & Mental Health, 16(3), 347–352. doi: 10.1080/13607863.2011.628977 [PubMed: 22129350]

Peavy GM, Salmon DP, Jacobson MW, Hervey A, Gamst AC, Wolfson T, et al. (2009). Effects of chronic stress on memory decline in cognitively normal and mildly impaired older adults. The American Journal of Psychiatry, 166(12), 1384–1391. doi: 10.1176/appi.ajp.2009.09040461 [PubMed: 19755573]

Phillips C, Baktir MA, Srivatsan M, & Salehi A (2014). Neuroprotective effects of physical activity on the brain: A closer look at trophic factor signaling. Frontiers in Cellular Neuroscience, 8, 170. doi: 10.3389/fncel.2014.00170 [PubMed: 24999318]

Portes A (1998). Social capital: Its origins and applications in modern sociology. Annual Review of Sociology, 24, 1–24. doi: 10.1146/annurev.soc.24.1.1

Pratt LA (2012). Characteristics of adults with serious mental illness in the united states household population in 2007. Psychiatric Services, 63(10), 1042–1046. doi: 10.1176/appi.ps.201100442 [PubMed: 23032677]

Prince PN, & Prince CR (2002). Perceived stigma and community integration among clients of assertive community treatment. Psychiatric Rehabilitation Journal, 25(4), 323–331. doi: 10.1037/h0095005 [PubMed: 12013260]

Ratey JJ, & Loehr JE (2011). The positive impact of physical activity on cognition during adulthood: A review of underlying mechanisms, evidence and recommendations Reviews in the Neurosciences (Vol. 22, pp. 171). [PubMed: 21417955]

Read J (2010). Can poverty drive you mad? 'schizophrenia', socio-economic status and the case for primary prevention. New Zealand Journal of Psychology, 39(2), 7–19.

Roick C, Fritz-Wieacker A, Matschinger H, Heider D, Schindler J, Riedel-Heller S, et al. (2007). Health habits of patients with schizophrenia. Social Psychiatry and Psychiatric Epidemiology, 42(4), 268–276. doi: 10.1007/s00127-007-0164-5 [PubMed: 17370043]

Russell DW (1996). UCLA loneliness scale (version 3): Reliability, validity, and factor structure. Journal of Personality Assessment, 66(1), 20–40. doi: 10.1207/s15327752jpa6601_2 [PubMed: 8576833]

Salzer MS, Baron RC, Menkir S-MA, & Breen L (2014). Community integration. In Nemec PB & Furlong-Norman K (Eds.), Best practices in psychiatric rehabilitation, 2nd *edition* McLean, Virginia: Psychiatric Rehabilitation Association.

Shankar A, Hamer M, McMunn A, & Steptoe A (2013). Social isolation and loneliness: Relationships with cognitive function during 4 years of follow-up in the english longitudinal study of ageing. Psychosomatic Medicine, 75(2), 161–170. doi: 10.1097/PSY.0b013e31827f09cd [PubMed: 23362501]

Silverstein SM, Moghaddam B, Wykes T, Gordon JA, Malhotra AK, & McGrath J (2013). Schizophrenia : Evolution and synthesis Cambridge, UNITED STATES: MIT Press.

Spaulding WD, Sullivan ME, & Poland JS (2003). Treatment and rehabilitation of severe mental illness New York, NY: Guilford Press.

Steptoe A, Owen N, Kunz-Ebrecht SR, & Brydon L (2004). Loneliness and neuroendocrine, cardiovascular, and inflammatory stress responses in middle-aged men and women. Psychoneuroendocrinology, 29(5), 593–611. doi: 10.1016/S0306-4530(03)00086-6 [PubMed: 15041083]

Stier A, & Hinshaw SP (2007). Explicit and implicit stigma against individuals with mental illness. Australian Psychologist, 42(2), 106–117. doi: 10.1080/00050060701280599

Stubbs B, Ku P-W, Chung M-S, & Chen L-J (2017). Relationship between objectively measured sedentary behavior and cognitive performance in patients with schizophrenia vs controls. Schizophrenia Bulletin, 43(3), 566–574. doi: 10.1093/schbul/sbw126 [PubMed: 27555659]

Stubbs B, Williams J, Gaughran F, & Craig T (2016). How sedentary are people with psychosis? A systematic review and meta-analysis. Schizophrenia Research, 171(1–3), 103–109. doi: 10.1016/j.schres.2016.01.034 [PubMed: 26805414]

Suetani S, Waterreus A, Morgan V, Foley DL, Galletly C, Badcock JC, et al. (2016). Correlates of physical activity in people living with psychotic illness. Acta Psychiatrica Scandinavica, 134(2), 129–137. doi: 10.1111/acps.12594 [PubMed: 27218211]

Takeuchi H, Thiyanavadivel S, Fervaha G, & Remington G (2017). Neurocognitive benefits of second-generation antipsychotics versus placebo: Insufficient evidence based on a systematic review. Journal of Clinical Psychopharmacology, 37(2), 274–276. doi: 10.1097/JCP.0000000000000662 [PubMed: 28129314]

Topor A, Ljungqvist I, & Strandberg E-L (2016). The costs of friendship: Severe mental illness, poverty and social isolation. Psychosis: Psychological, Social and Integrative Approaches, 8(4), 336–345. doi: 10.1080/17522439.2016.1167947

Trembley MS, Aubert S, Barnes JD, Saunders TJ, Carson V, Latimer-Cheung AE, et al. (2017). Sedentary behavior research network (SBRN) - terminology consensus project process and outcome. International Journal of Behavioral Nutrition and Physical Activity, 14, 75–91. doi: 10.1186/s12966-017-0525-8 [PubMed: 28599680]

Vancampfort D, De Hert M, De Herdt A, Vanden Bosch K, Soundy A, Bernard PP, et al. (2013). Associations between physical activity and the built environment in patients with schizophrenia: A multi-centre study. General Hospital Psychiatry, 35(6), 653–658. doi: 10.1016/j.genhosppsych.2013.07.004 [PubMed: 23954096]

Vancampfort D, Probst M, Sweers K, Maurissen K, Knapen J, & De Hert M (2011). Relationships between obesity, functional exercise capacity, physical activity participation and physical self-perception in people with schizophrenia. Acta Psychiatrica Scandinavica, 123(6), 423–430. doi: 10.1111/j.1600-0447.2010.01666.x [PubMed: 21219266]

Vancampfort D, Rosenbaum S, Probst M, Connaughton J, du Plessis C, Yamamoto T, et al. (2016). What are the top 10 physical activity research questions in schizophrenia? Disability and Rehabilitation: An International, Multidisciplinary Journal, 38(22), 2235–2243. doi: 10.3109/09638288.2015.1116622

Vancampfort D, Rosenbaum S, Probst M, Soundy A, Mitchell AJ, De Hert M, et al. (2015). Promotion of cardiorespiratory fitness in schizophrenia: A clinical overview and meta-analysis. Acta Psychiatrica Scandinavica, 132(2), 131–143. doi: 10.1111/acps.12407 [PubMed: 25740655]

Wang Y, Cui JF, Chan RCK, Deng YY, Shi HS, Hong XH, et al. (2009). Meta-analysis of prospective memory in schizophrenia: Nature, extent, and correlates. Schizophrenia Research, 114(1–3), 64–70. doi: 10.1016/j.schres.2009.07.009 [PubMed: 19713081]

Weinberger DR (1987). Implications of normal brain development for the pathogenesis of schizophrenia. Archives of General Psychiatry, 44(7), 660–669. doi: 10.1001/archpsyc.1987.01800190080012 [PubMed: 3606332]

World Health Organization (2017). Global strategy on diet, physical activity and health Retrieved August 17, 2017, from http://www.who.int/dietphysicalactivity/pa/en/

Wykes T, Huddy V, Cellard C, McGurk SR, & Czobor P (2011). A meta-analysis of cognitive remediation for schizophrenia: Methodology and effect sizes. The American Journal of Psychiatry, 168(5), 472–485. doi: 10.1176/appi.ajp.2010.10060855 [PubMed: 21406461]

Zai G, Robbins TW, Sahakian BJ, & Kennedy JL (2017). A review of molecular genetic studies of neurocognitive deficits in schizophrenia. Neuroscience and Biobehavioral Reviews, 72, 50–67. doi: 10.1016/j.neubiorev.2016.10.024 [PubMed: 27866942]

Zhang M, Gale SD, Erickson LD, Brown BL, Woody P, & Hedges DW (2015). Cognitive function in older adults according to current socioeconomic status. Aging, Neuropsychology, and Cognition, 22(5), 534–543. doi: 10.1080/13825585.2014.997663

Public Policy Relevance

The present paper extends perspectives of poor neurocognitive functioning among those with schizophrenia beyond pathogenesis toward one that accounts for consequences of reduced community participation, namely sedentary behavior, loneliness, and poverty. Findings from the reviewed literature, especially if corroborated by future research, suggest that promoting community participation offers promise for improving neurocognitive functioning and performance-based functional outcomes in this population. Interventions and policy efforts designed to address both personal and environmental obstacles to participation are needed.