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The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Assistant Dean for MSN and DNP Studies, on behalf of the program; we verify that this is the final, approved version of the student's DNP Project including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Adam A. Loose, Student

Dr. Peggy El-Mallakh, Advisor

Running Head: PERCEPTIONS ABOUT COGNITIVE ENHANCEMENT THERAPY

DNP Final Project Report

Perceptions about Cognitive Enhancement Therapy among Regional Mental Health Providers: a
Mixed Methods Analysis

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University of Kentucky

College of Nursing

Fall 2017

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PERCEPTIONS ABOUT COGNITIVE ENHANCEMENT THERAPY

Dedication

I would like to dedicate this project to my wife Carol. I could not have gotten to this point in my life without her. She has travelled down this road with me and I am glad we have finally reached the end of the journey. She is a wonderful therapist and an even better wife and mother. Thank you for everything.

Acknowledgements

I would like to thank the members of my committee for all of the hard work they put into me and the hours that they put into helping me edit and refine this project. It would not have been possible without you. I am honored to count myself among your colleagues. I would also like to thank the rest of faculty and staff of the University Of Kentucky College Of Nursing. This has been a wonderful 7 and a half year journey for me and I have grown tremendously in my years of study here. I cannot tell you how much it had meant to me that I am among you distinguished alumni now. I am very proud of all that the community continues to accomplish.

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Introduction to Final DNP Project

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Introduction

Schizophrenia is a severe mental illness which is characterized by a diverse symptomology divided into three distinct categories: positive, negative, or cognitive (Tarrrier & Taylor, 2014). Positive symptoms take the form of auditory or visual hallucinations. The person with schizophrenia may hear voices which speak about the person in the third person. They may experience delusions; these are bizarre, strongly held beliefs which may arise from a misinterpretation of facts or misperception of experience. Delusions take a variety of themes including alien control, persecution, or religious. The person may also have disordered thought (which is different from cognitive dysfunction) this manifest is disordered or disorganized speech. Positive symptoms are characterized by a distortion or excess or normal functioning (Tarrrier & Taylor, 2014).

Negative symptoms are frequently “present” but they refer to an absence or restriction in the person’s normal function (Tarrrier & Taylor, 2014). This manifests in a loss of intensity or range of emotions, in fluency or productivity of thought and speech, and in initiation of behavior. The consequences of these symptoms can be dysfunction in personal, social, occupational, and vocational functioning. There is often a comorbid diagnosis of depression. Suicide risk is high (Tarrrier & Taylor, 2014).

Cognitive symptoms are a loss of global functioning which prevents a person from performing higher executive functions. They are unable to organize thoughts to allow for acts of daily living. This prevents them from being able to hold a job, pay bills, or often perform daily hygiene or routine maintenance which day-to-day living requires. Cognitive dysfunction must be

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present for schizophrenia to be diagnosed. It also has the symptomology which does not respond to medication management (Chou, Twamley, & Swerdlow, 2012).

Individuals who are diagnosed with schizophrenia face a considerable burden, as do their families, and often the communities in which those individuals live (Eack, 2012). Schizophrenia causes impairments which significantly limits their ability to functionally recover (Chou, et al., 2012). Advances in pharmacotherapy alleviate perceptual alterations such as delusions and hallucinations, but do not address cognitive deficits and problems with attention, memory, abstract thinking and memory (Chou, et al, 2012).

This deficit in treatment, caused because needs are only partially met by a medical model, is the type of situation which the Doctor of Nursing practice degree is educated and equipped to address. The advanced practice nurse is able to use the medical model to prescribe medication management, but can also focus on holistic care, which is the foundation of nursing practice. This holistic care seeks to find interventions based upon the best evidence that will meet the needs of the population which medication cannot meet.

Cognitive Enhancement Therapy (CET) was developed by multidisciplinary teams to address cognitive deficits in people with schizophrenia (Eacks, 2012). CET includes several approaches to improve cognitive functioning in people with schizophrenia, such as; 3 memory, 7 attention, and 6 problem solving exercises. An example of an attention exercise is training where individuals react with a space bar press when they see a central light flashing on the screen. The time interval starts at 5s then progressively gets shorter. In memory training several objects from the bottom of the screen are flashed on the upper portion of the screen for 3s. Individuals must remember the objects and locations. Individuals must learn to encode objects and locations in

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meaningful ways which means they must invent a naming system for each object and arrangement. A problem solving example is number arrangement. Individuals may change positions of numbers by clicking on them with a mouse. The individual must determine the rules for moving the numbers then make a plan to move the numbers in the fewest number of clicks. The Neurocognitive component helps facilitate the social cognitive piece. The computer training takes place in peer focus pairs with the aid of a CET coach in a group setting. During the group they will also have group exercises in perspective taking, rehearsing social cues, social context appraisal, and participating in unrehearsed social situations. CET established a goal to provide a unique holistic approach to cognitive remediation in an attempt to improve function outcomes for patients with schizophrenia (Eack, 2012)

The development, testing, and use of CET emphasize the importance of multidisciplinary teams in intervention research. The goal of this DNP Practice Inquiry Project was to examine several aspects of CET, including current research and the state of the evidence base. In addition, this project implemented a mixed methods study to examine provider knowledge about CET and perceptions about the feasibility of CET implementation in a region of a south-central state of the US.

This practice inquiry project includes three manuscripts. The first is an examination of horizontal violence among nurses and its effect on patient outcomes. The inclusion of this manuscript is to demonstrate the important of communication among nurses and the importance of collaboration. It illustrates the importance of interprofessional collaboration and leadership among professionals who care for vulnerable populations, such as those diagnosed with schizophrenia. The second manuscript is a review of the literature behind CET. The third manuscript is a mixed methods study of the perceptions about Cognitive Enhancement Therapy

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among regional mental health providers. In addition, this study also examines facilitators and barriers to implementation to a CET program in that region.

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Manuscript 1:

Bullying: Does Horizontal Violence Influence Patient Outcomes?

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PERCEPTIONS ABOUT COGNITIVE ENHANCEMENT THERAPY

Abstract

This paper is a review of the literature addressing horizontal violence and the relationship to patient outcomes. The five reviewed studies all examined nurses experience of horizontal violence. The studies conducted surveys and follow up interviews. The studies determined that horizontal violence is a phenomenon occurring across the spectrum of nursing. One study (Ceravolo, et al, 2013) conducted workshops and found that improved communication decreases horizontal violence. Another (Wilson & Phelps, 2013) found that patient safety is compromised by horizontal violence. This literature warrants further study on patient outcomes and improved communication among nurses and other professional staff.

Bullying: Does horizontal violence decrease patient outcomes?

Introduction

The healthcare environment causes high levels of stress among healthcare workers, yet all members of a healthcare team must function at their highest level to ensure the optimal patient outcomes (The Joint Commission, 2008). Problems with team cohesion and efficiency (such as a gap in provider knowledge or their failure to act on behalf of their patient) may lead to deterioration in a patient's condition, or possibility mortality. Several workplace factors influence team cohesion and efficiency. For example, the issue of horizontal violence among nurses has been identified as a factor that can contribute to poor patient outcomes (reference 1, reference 2, reference 3 etc.). Horizontal violence first appeared in nursing literature over 25 years ago (Sheridan-Leos, 2008). The literature defines horizontal violence as patterns of behavior among nurses that overtly or covertly direct their dissatisfaction towards those less powerful than themselves, themselves, and/or each other (Sheridan-Leos, 2008). Horizontal violence may take the form of gossiping, undue criticism, innuendo, scapegoating, undermining, and passive-aggression (Weinand, 2008). In addition, it is characterized as a series of incidents occurring over time, rather than an isolated incident. Over time, horizontal violence results in the victim feeling overwhelmed, and may cause symptoms of depression and post-traumatic stress disorder (Becher & Visovsky, 2012).

Advanced practice providers, particularly those in the mental health role, are in a position to address the problem. The Psychiatric Mental-Health Nurse Practitioner can act as a liaison between nursing staff to help facilitate conflict resolution. In addition, the potential for stress management and coping skills education for nursing staff is an advantage the advanced practice provider can bring to the improvement of nursing science. The aim of the study is discerning if

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conflict resolution and coping reduces stress in nursing staff and the subsequent impact on patient outcomes. The purpose of this literature review is to examine the evidence base to find if horizontal violence among nurses in a hospital setting has an influence on patient outcomes.

Methods

A search conducted on the CINAHL database using the search terms: Horizontal Violence, Nurses, and Patient Outcomes. The initial query of these search terms provided no articles. The term Horizontal Violence was changed to Bullying and still yielded no results. Removal of the term Patient Outcomes and a search with only Bullying and Nurses as key words yielded positive results. A review of the articles revealed 1,248 articles outside of the desired result. Parameters limited articles to English language articles published between January 2000 and February 2014. The studies had to be among nurses with no age specification. Studies conducted in the U.S. and international countries published in the English language were included. Literature reviews and meta-analyses were also excluded from this review. The total number of studies retrieved from CINAHL was 135 studies. After assessing titles and abstracts of the 135 studies 5 were selected for review.

Results

The included studies represented a cross section of nurses from different countries and nursing specialties. One study followed members of a nursing association in Australia, a study examined the experience of young nurses in New Zealand (Clendon & Walker, 2012), one looked at a cross section of nurses in the United Kingdom (Wilson & Phelps, 2013), one studied relationships in operating room nurses in New Jersey (Chipps, et al, 2013), and one study examined horizontal violence in a 220 bed acute care hospital in the southwest (Hutchinson, et

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al, 2012). All studies looked at horizontal violence and the effect on nursing. Wilson & Phelps (2013) examined horizontal violence and negative consequences on nursing care of patients while Chipps et al (2013) examined nurses' perception of horizontal violence on patient safety. Among the five studies, two (Ceravolo, et al, 2012; Chipps, et al, 2013) made an effort to determine the effects of demographic and multidimensional factors in their studies. Clendon & Walker (2012) focused primarily on young nurses in New Zealand.

Four studies employed surveys as the primary means of evaluation. The study by Clendon & Walker (2012) was a qualitative design using semi-structured interviews. Two studies (Ceravolo, et al, 2012; Chipps, et al, 2013) conducted surveys but not personal or group interviews. The five studies broadly defined horizontal violence as hostile behaviors that occur over time and have negative impacts on the individual and workplace including creating a hostile environment. This may include personal attacks, attacks through task, and attacks on reputation and confidence. Chipps et al. (2013) also expanded the definition of bullying to include being ignored as a form of bullying. Only one study (Ceravolo, et al, 2013) provided an intervention. They conducted communication workshops to help create lines of communication between management and peers on the nursing units.

Most studies were descriptive and only one study (Ceravolo, et al, 2013) provided an intervention by conducting communication workshops to help create lines of communication between management and peers on the nursing units. There was also broad agreement between the studies that communication between peers and management needed to improve. All studies advocated conflict management as a way to deal with horizontal violence. Ceravolo, et al, (2013) demonstrated a decreased rate of horizontal violence after the implementation of the communication workshops. The number of nurses who reported incidents of horizontal violence

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decreased from 90% to 76% after the intervention (Ceravolo, et al, 2013). Wilson & Phelps (2013) also found that nurses actively compromised patient safety by their actions, mainly due to an unwillingness to ask for help.

Implications

Findings and implications of these studies fall into two categories of nursing practice. One area is nurses' own personal health and well-being. The second area is direct patient safety and outcomes affected by unit work conditions. The studies had broadly similar findings and conclusions. All five reviewed studies concluded that horizontal violence is a problem for nurses. Horizontal violence creates a work place that is not conducive for proper patient care. Clendon & Walker (2012) demonstrated that young nurses in particular experience horizontal violence and this contributes to early burnout and nurses leaving the profession. Hutchinson, et al, (2013) concluded that multidimensional factors contribute to the level of horizontal violence experienced. Gaps demonstrated by these studies included the lack of data on patient outcomes. In addition, there is a noticeable lack of information on the degree to which other members of the healthcare team influence nursing effectiveness due to horizontal violence. An area for future study can focus on how much perceived abuse from physicians and other members of the healthcare team contributes to perceptions of horizontal violence in the nursing profession.

All reviewed studies demonstrated that nurses and nurse managers need more education on horizontal violence and the negative effects that can occur related to nurses' well-being and patient safety. Two studies (Clendon & Walker, 2013; Hutchinson, et al, 2013) emphasized the involvement of nurse managers in dealing with the issue and preventing new incidents of horizontal violence. Two studies called for the involvement of hospital administration along with

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nurse managers (Wilson & Phelps, 2012; Chipps, et al, 2013) with an emphasis on the need for conflict resolution. Ceravolo et al. (2012) demonstrated that improved communication can reduce the conflict between nurses and help managers deal with the problems. The research points to a needed change in nursing practice at both management and floor levels.

The findings from the studies illustrate the issue of horizontal violence and patient safety. Only Wilson & Phelps (2012) addressed the implications of this issue for patient safety, but all five pointed to lack of communication as a major contributing factor to poor patient outcomes. The five studies emphasized the need for improved communication on nursing units. In addition, the studies also advocated for improved multidisciplinary communication and the need for a better communication process. All studies demonstrated the need for further research into the issue and laid a foundation for its continued research. They also point to a need for improved communication, not just between nurses but healthcare professionals in all disciplines. Further research is warranted on the effects of stress management on the ability to improve nursing practice and the effect on horizontal violence.

Ceravolo, et al, (2013) implemented communications workshops that produced a reduction in horizontal violence. Workshops allow nurses to learn and practice skills. Shared educational opportunities could also create participation with other disciplines and improve multidisciplinary communication. The manager would still need to drive unit communication, teambuilding, and anti-bullying initiatives. Initiatives to decrease horizontal violence on individual units would ensure that nurses would learn to communicate with their direct coworkers. A hospital driven educational initiative, implemented by a Human Resources Department or Nursing Staff Development, could work with individual units to address their unit specific problems.

Conclusion

The effect of horizontal violence on nurses' well-being is a topic that needs to be studied; it is useful in generating an evidence base related to patient outcomes. In this case the need for improved multidisciplinary communication is evident. The needs of vulnerable populations are not effectively served if no one is going to speak out and advocate for them. Nursing needs to be a voice for advocacy in both the intra- and inter-professional environment.

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<http://dx.doi.org.ezproxy.uky.edu/10.1097/NHL.0b013e3182861503>

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Table 1: Evidence Table for Horizontal Violence

Complete citation	Ceravolo, D., Schwartz, D., Foltz-Ramos, K., & Castner, J. (2012). Strengthening communication to overcome lateral violence. <i>Journal of Nursing Management</i> , 20(5), 599-606. doi: http://dx.doi.org.ezproxy.uky.edu/10.1111/j.1365-2834.2012.01402.x	Clendon, J., & Walker, L. (2012). Being young: a qualitative study of younger nurses' experiences in the workplace. <i>International Nursing Review</i> , 59, 555-561.	Hutchinson, M., Wilkes, L., Jackson, D., & Vickers, M. (2010). Integrating individual, work group and organizational factors: testing a multidimensional model of bullying in the nursing workplace. <i>Journal of Nursing Management</i> , 18(2), Retrieved from http://dx.doi.org.ezproxy.uky.edu/10.1111/j.1365-2834.2009.01035.x	Wilson, B., & Phelps, C. (2013). Horizontal hostility a threat to patient safety. <i>JONA's Healthcare Law, Ethics & Regulation</i> , 15(1), 51-57. doi: http://dx.doi.org.ezproxy.uky.edu/10.1097/NHL.0b013e3182861503	Chippes, E., Stelmaschek, S., Albert, N., Bernhard, L., & Holloman, C. (2013). Workplace bullying in the or: Results of a descriptive study. <i>AORN Journal</i> , 98(5), 479-93. doi: http://dx.doi.org.ezproxy.uky.edu/10.1016/j.aorn.2013.08.015
Research purpose, question, or hypothesis	Reduction of lateral nurse to nurse violence and creation of a better workplace culture through a series of workshops	Explore the experiences of young nurses in New Zealand and their experience of horizontal violence	Developing an understanding of nursing in the boarder context and strategies to deal with it on an institutional level	Determine the effect of horizontal violence on nursing actions and the impact on their patient care	Determine the effects of multiple demographic factors on workplace bullying and if bullying leads to exhaustion among staff
Study design	Quasi-experimental; no control group	Qualitative; semi-structured interviews in two focus groups	Descriptive cross sectional study, surveys and structured interviews	Descriptive study, surveys	Descriptive correlational study; surveys
Independent and dependent variables	IV: multifaceted MI intervention [Workshops that addressed communication and conflict management and	N/A	N/A	N/A	IV: Race, gender, ethnicity, years of experience, years in profession, and job title DV: experience of bullying

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	support among nurses with an emphasis on nurse managers] DV: Report of verbal abuse				
Sample and setting	Intervention: 4000 nurses in 203 workshops over a 3 year period	Intervention: 3093 nurses given survey with 647 respondents. Of this group two groups selected one of 7 and one of 8	370 respondents; 301 clinical, 65 management 92.7% women, 6.2% men; mean age is 44.3	500 nurses in a 2 month period in 2011. In a hospital setting. In a 220 bed acute care facility	Group of 167 cross sectional personnel whom responded to the survey. 44.7% RN, 53.4% surgical techs, 1.9% unlicensed personnel. Average age 41.3 years. 78.9% female, 76.3% white, 20.1% black, 6.3% "other." Average time on the job 5.7 years, and time in profession 11.3 years.
Conceptual framework	Grounded theory methodology	None reported	Social support theory	None reported	Hutchinson's group bullying model
Methods and measures	Surveys pre- and post- intervention	Surveys then unstructured interviews in a group setting conducted by a nurse	Integrated multidimensional survey tool developed for this study	28 question surveyed aimed at identifying horizontal violence and the affect on nursing judgment and actions	23 question survey tool.
Reliability and validity	multiple surveys	N/A, surveys not used for the final results	Random sampling	Trustworthiness:, peer review, selected random sample	selected random sample
Statistical /data analysis	Paired t-tests; descriptive statistics	Constant comparison method	Chi squared test; descriptive statistics	Frequencies; descriptive statistics	Fisher's test; descriptive statistics
Key findings	There was a decline in the groups that underwent the surveys moving from 90% experiencing verbal abuse to	The researchers developed themes and areas for further research and to develop interventions.	The findings have important implications for the management and prevention of bullying. They suggest strategies to address the problem need to focus upon	The findings demonstrated that nurses who experienced horizontal violence where more likely to perform actions that were not safe for patient care. These included not questioning orders, not asking for assistance lifting a	Over half 59% experienced bullying, and 34% as many as two events each week, being ignored was the most common type of bullying, and emotional exhaustion did correlate with bullying. The respondents did not perceive

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	76% experiencing verbal abuse but a significant portion still felt abuse.		work group and organizational factors.	patient or when using unfamiliar equipment, or carrying out orders not in the best interest of a patient	patient safety compromise by bullying. Individuals may not identify a behavior as bullying.
Limitations	Survey response rates, one hospital, and economic factors that may have skewed numbers. voluntary participation	Sample size, cross sectional sample. voluntary participation	Sample size, cross sectional sample. voluntary participation	Small sample size and limited population, voluntary participation	No official exercise component; participants expected to exercise independently Did not report on biological markers.
Results/implications	Improved communication is effective in reducing verbal abuse and increasing feelings of empowerment	The findings suggest that nurse leaders and managers should implement safeguards and methods to safe guard and protect young nurses	The findings draw in question the usefulness of current approaches to managing bullying and useful to nurse managers, particularly those tasked with providing safer and more productive workplaces.	Patient safety is compromised by horizontal violence. Hospital administration needs to address the issue in order to prevent sentinel events.	Educational is needed for individuals to be able to identify a behavior as bullying and react to it appropriately. Training is needed for managers in conflict resolution and identifying covert and passive aggressive bullying.

Manuscript 2:

Cognitive Enhancement Therapy for Patients with Schizophrenia: A Systematic Review of

Evidence

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Abstract

People diagnosed with schizophrenia experience cognitive symptoms that present challenges in daily functioning. Medications have made symptom relief a possibility for some of the problems associated with the disorder. Cognitive dysfunction cannot be addressed by medications and traditional therapies show limited success. Specific cognitive therapies have demonstrated promise in recent studies. This paper will review the literature and determine if cognitive therapies show improvement in cognitive function.

Background

Schizophrenia is a chronic and disabling mental disorder that causes progressive neurodegeneration throughout the course of the patient's life (Eack, 2011). The disorder manifests itself in distinct symptom sets that are unique for each patient but fall within characteristic groups. The symptoms may be positive, negative, and cognitive (American Psychiatric Association, 2013). The typical patient suffers from some combination of symptom types. Advancements in antipsychotic medications have allowed patients to have symptom relief and to live outside of the hospital environment. The medications provide relief and control over delusions, hallucinations, and paranoia.

While treatment with medication provides relief for those symptoms that fall on the positive spectrum they provide little to no relief for negative and cognitive symptoms (Eack, Hogarty, Greenwald, Hogarty, & Keshaven, 2011; Chou, Twamley, & Swerdlow, 2012). Cognitive impairments have been broadly separated into two categories: neurocognition and social cognition (Eack, et al, 2011). Neurocognitive impairments represent difficulties in basic cognitive processes such as attention, memory, and basic problem solving skills. Individuals with schizophrenia consistently perform at least one standard deviation below healthy individuals on several neurocognitive tests (Eack, et al, 2011). Social cognition refers to higher-order cognitive processes that support interpersonal interactions. It is a much broader umbrella definition for social cognition but generally agreed upon elements include perspective taking, theory of mind, emotion perception, social context appraisal, and emotional regulation (Eack, 2012).

These impairments manifest in a variety of symptoms. It affects the patient's attention span and ability to focus, short term memory or ability to form long term memory, and ability to problem solve. Patients with schizophrenia demonstrate a substantial difficulty taking the

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perspective of others, recognizing emotional and social cues, and regulating stress and negative emotions (Eack, et al, 2011). Cognitive symptoms provide a challenge because disordered thinking prevents the patient from carrying out functions of everyday living. Without proper cognitive function the schizophrenic patient will never be able to hold a job, pay bills, or properly care for day to day life (Chou, et al, 2012).

Recently programs and studies geared toward cognitive improvement for schizophrenic patients have shown some promise in improving cognitive functioning. These therapeutic techniques could be an extremely important tool for mental health professionals providing treatment to schizophrenics. Therapeutic goals include improvements in several cognitive domains such as memory, attention, executive functioning, or basic tasks such as early perceptual processing and working memory (Thorsen, Johansson, & Loberg, 2014; Eack, et al, 2011; Chou, et al, 2012; Kaneko & Keshaven, 2012). The aim of this paper is to review the literature and determine if cognitive enhancement therapies demonstrate improvement in cognitive functioning among people with schizophrenia. A second aim of this review is to assess the quality of the literature and determine if there is sufficient evidence to warrant a change in practice.

Methods

The scope of this review is patients with schizophrenia who are undergoing cognitive enhancement therapy. Cognitive enhancement therapy (or cognitive remediation) is a specific group of therapies aimed at improved cognitive outcomes for patients diagnosed with schizophrenia. Pharmacological studies are not within the scope of this search and studies that show improvement based only upon medication management are important but not beneficial for this paper.

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Conducting this literature review began with a search of three databases: CINAHL, PubMed, and PsychInfo. The PubMed query began with search terms schizophrenia and cognitive therapy. That search yielded a result of 4744 articles. The next query added the word “enhancement” as a modifier to therapy and yielded 181 articles. Further refining of the search modified therapy to “therapy/remediation” and yielded 24 articles. Of these 24 articles 12 did not address schizophrenia and could be excluded. Two articles addressed primarily pharmacological treatment of cognitive disorders. Ten articles fit the criteria and were reviewed.

The key terms from the PubMed search helped guide the CINHALL search. The search used the key terms schizophrenia and cognitive enhancement or cognitive remediation. This search limited to the last five year, 2010-2015, resulted in a manageable 26 articles. Upon review of these 26 articles it became clear that they duplicated with the articles from PubMed along with additional articles that addressed cognitive therapy used for other disorders.

The final database search was of Psychinfo. The first search used the key words schizophrenia and cognitive enhancement. The return was 157 articles. Limiting this to the last five years returned a result of 79 articles. By changing the time limits to the last four years the articles limited to 62. One further limiting attempt excluded pharmacology and returned 52 articles. A title and abstract review of these 52 showed duplicate studies and some articles that addressed pharmacological treatment without cognitive therapy. Additionally many articles address cognitive therapy for patients with eating disorders which are not part of this review.

Findings

10 articles were based upon randomized control trials. Four articles were based upon the same patient group with each article addressing different patient outcomes (Eack, Greenwald, Hogarty, Cooley, Dibarry, Montrose, & Keshaven, 2009; Eack, et al, 2011; Eack, Hogarty, Cho, Prasad, Greedwald, Hogarty, & Keshavan, 2010; Eack, Mesholm-Gately, Greenwald, Hogarty, & Keshavan, 2013). One article was a randomized control trial of 145 patients with schizophrenia or schizoaffective disorder (Bell, Fiszdon, Greig, Wexler, & Bryson, 2007). Another article followed a study of 70 patients with schizophrenia or schizoaffective disorder in a randomized control trial. They followed the group over the course of two years (Greig, Zito, Wexler, Fiszdon, & Morris, 2007). There was an article examining a randomized control trial of cognitive remediation and vocational rehabilitation against vocational rehabilitation alone (McGurk, Mueser, DeRosa, & Wolfe, 2009). The final article was a randomized control trial measuring the outcomes of outpatients with schizophrenia or schizoaffective disorder in a visual cognitive remediation program combined with vocational training vs those undergoing vocational therapy alone (Surti, Corbera, Bella, & Wexler, 2011).

Randomized control trials represent the highest quality of evidence. In the case of CET the number of RCTs is small (4 articles using the same trial to measure different outcomes) but they do represent a high quality of evidence. In addition, the rest of the articles represent primary source material which, although not using CET as the therapeutic intervention, use a computer based cognitive therapeutic cognitive intervention similar to the CET model. These studies form a high quality primary source evidence base for investigation into cognitive remediation therapies.

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Therapeutic approaches

The following review of literature was performed to explore the use and benefits of Cognitive Enhancement Therapy (CET) vs. Enriched Supportive Therapy (EST). The therapeutic interventions within each program are similar but present enough differences to warrant a brief examination of each.

Cognitive Enhancement Therapy (CET)

Several departments at the University of Pittsburgh collaborated on the development of a program titled Cognitive Enhancement Therapy (CET). The program set a dual therapeutic approach of treatment based on cognitive remediation using a computer based program which improves neurocognition while simultaneously addressing social-cognitive domains. Patients complete a computer-based program, and participate in individual, group, and experiential therapies addressing social cognition (Eack, et al, 2011). CET consists of 60 hours of computer-based training which target personal improvement in memory, attention, and problems solving. This training takes place in a group setting and is based upon participant pairs. Participant pairs consist of two participants who are placed in a peer pair group for peer coaching and encouragement with the aid of a CET coach.

CET integrates the 60 hours of computer based pair training into 45-1.5 hour group training social-cognitive group sessions. In these group sessions, participants learn various social-cognitive abilities such as perspective-taking, social context appraisal, and rehearsing social cues. The participants then apply these skills in the group setting in vivo cognitive exercises, homework, and unrehearsed social situations (Eack, et al, 2011).

Enriched Supportive Therapy (EST)

Enriched Supportive Therapy (EST) is an illness management and psychoeducational approach based on components of another therapeutic approach (Eack, et al, 2011). EST combines individual sessions across two separate phases. Phase I focuses on psychoeducation about schizophrenia, the role of stress in the disorder, and stress avoidance or minimization. Phase II trains participants about identification and management of stressors which pose particular challenges to their own social and role functioning. Some examples of EST techniques include identification of early warning signs of stress and psychotic relapse, diaphragmatic breathing, healthy passive and active relaxation strategies, pro-social behavior, and conflict avoidance. EST is not specifically designed to address employment although methods of managing stress related to employment were taught to individuals who expressed employment as a goal (Eack, 2011). This group served as the control group for study used in four of the articles (Eack, et al, 2009; Eack, et al, 2010; Eack, et al, 2011; Eack, et al, 2013).

Computer-based cognitive remediation, Neurocognitive Enhancement Therapy, Vocational training

CET is not the only cognitive remediation program for patients with schizophrenia. A small (n =14) study from Yale implemented a computer based training program aimed at improving cognitive visual memory (Surti, et al, 2011). The participants in this study were patients diagnosed with schizophrenia or schizoaffective disorder. The program was an on-going randomized control trial. The participants would randomly participate in computer based cognitive remediation (CCR) but were limited to visual memory exercises. They would take pre- and post-testing that day. The participants demonstrated improvement in visual learning which was consistent with the hypothesis and it was statistically significant. However, it did

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demonstrate a limitation of the CCR program because of its specificity to visual memory outcomes (Surti, et al, 2011).

A program implemented at Yale randomly assigned 72 patients diagnosed with schizophrenia or schizoaffective disorder (62 whom completed the program) to a program of either Neurocognitive Enhancement Therapy (NET) and vocational training (n=33) or vocational training alone (n=29). NET is a computer based cognitive remediation program targeted specifically at workplace related cognitive issues focusing on improving attention, language, memory, and executive functioning (Greig, et al, 2007). NET includes social information processing and a work feedback group. Findings indicated that NET and vocational training had significantly higher standardized scores for those with NET and vocational training than vocational training alone ($p<.01$) (Greig, et al, 2007; Bell, et al, 2007).

The group out of Yale conducted an additional study using NET with work therapy (WT) or work therapy (WT) alone on a much larger sample (n=145) (Bell, et al, 2007). The participants were patients diagnosed with either schizophrenia or schizoaffective disorder. They conducted testing at 6 months and 12 months and had an 80% (n=116) retention rate. The study found a statistically significant neurophysiological improvement rate in both working memory ($p<0.05$) and executive functioning ($p<0.05$) for those in NET and WT than WT alone after 12 months.

Another approach in a 3-month trial of an inpatient group of patients with schizophrenia (n=42) used various training methods (a form of teach back, inductive reasoning exercises, memory exercises such as rehearsal, using mnemonic aids, and using compensatory strategies to help with emotional regulation) to facilitate cognitive improvement and emotional perception. The control group would not participate in the same set of exercises. After completing the 3

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month program the cognitive training group demonstrated significant ($p < 0.05$) improvement in emotional perception and memory ($p < 0.10$) (van der Gaag, Kern, van den Bosch, & Libermann, 2002).

Recovery domains

Studies of therapeutic cognitive interventions identified specific areas of cognitive remediation and rehabilitation. The articles separated the recovery areas into two broad categories: neurocognitive and social cognitive (Eack, et al, 2011; Thorsen, et al, 2014; Eack, et al, 2011; Chou, et al, 2012; Kaneko & Keshaven, 2012).

Neurocognitive

Neurocognitive recovery is demonstrated recovery in the areas supportive of higher areas of thinking and reasoning. Supportive cognitive areas include verbal memory and attention (Eack, 2012). Cognitive remediation, specifically computer based cognitive remediation, have statistically significant improvement on neurocognition when compared to supportive but non-cognitive focused therapeutic interventions (Eack et al, 2011; Surti, et al, 2011; Kaneko & Keshaven, 2012).

CET groups demonstrated significant improvement in simple reaction time, choice reaction time, and visual-spatial scanning compared with EST ($p = .023, d = .46$) (Eack, et al, 2009). They also demonstrated ($p = 0.23, d = .46$) improved verbal and working memory along with better executive functioning, language ability, psychomotor speed, and neurological soft signs compared to the EST group (Eack, et al, 2009).

Social Cognitive

Social cognitive improvement facilitates and improves interactions and interpersonal relationships (Eack, 2012). A variation on this is vocational improvement (Greig, et al, 2007).

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Although a separate domain from social cognition there is enough overlap to justify addressing vocational improvement. Results from one study demonstrated vocational improvement even when vocational rehab was not a focus of the program (Eack, et al, 2011). In the Eack, et al, (2011) study (n=58) patients in a CET program focused on social-cognitive groups by responding in unrehearsed social exchanges, presenting homework, participating in cognitive exercises that focus on experiential learning, providing feedback to peers, and chairing homework sessions (Eack, 2011). The goal of the program is to teach adaptation in social situations which is why they are able to cope with work stress and situations without specific vocational training. CET participants would set goals before the program and could state employment as a goal but there was no specific program tailoring (Eack, 2011).

Individuals in the CET study group were more likely to obtain new employment than those in EST group (54% vs 18%), maintain employment (54% vs 18%), and gain skilled employment (39% vs 18%) (Eack, 2011). Those individuals also had higher reported earnings and job satisfaction scores and found the CET group scored higher with statistical significance ($p=.044$; $.009$) (Eack, et al, 2011).

When paired with interventions aimed at neurocognitive improvement social cognitive and vocational rehabilitation programs were significantly more successful. Using employment as a standard, those who went through a program that addressed both neurocognitive remediation and vocational rehabilitation were able to work more hours and earn more salary than those who had only undergone traditional therapy (McGurk, Mueser, DeRosa, & Wolfe, 2009; Greig, Zito, Wexler, Fiszdon, & Bell, 2007).

Social cognitive functioning showed similar results to vocational rehabilitation outcomes; there was significant improvement with combination neurocognitive and vocational

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therapy (McGurk, et al, 2007; Greig, et al, 2007, Kaneko & Keshavan, 2012; Surti, et al, 2011).

In the McGurk, et al, (2007) study patients who attended a computer based cognitive training and vocational rehabilitation worked more internship hours and earned higher wages upon comparison of Mann-Whitney U tests than vocational rehabilitation alone.

Limitations

The two greatest limitations are the small sample sizes of the RCTs and the limited number of randomized control trials. A good example of this is the four articles measuring four different outcomes generated from one RCT. These limitations exist because of the nature of the population and the eligibility criteria of the programs. The program is designed for patients that are medication stable and able to make it to the sessions. It is a demanding program that requires a time effort from the patient. Often the population makes it harder to find those who meet criteria.

Discussion

Implications

While the studies used have been small the results demonstrate a statistically significant effect on cognitive functioning for those in therapy. It is important to note that the studies demonstrate the need for the two pronged approach to cognitive therapy. It is not enough to just improve neurocognitive function. Interventions should treat both the neurocognitive and social cognitive domains for patients to gain meaningful improvement (McGurk, Mueser, DeRosa, & Wolfe, 2009; Greig, Zito, Wexler, Fiszdon, & Bell, 2007; Eack et al, 2011; Surti, Corbera, Bella, & Wexler, 2011; Kaneko & Keshaven, 2012).

Practitioners should, once achieving meaningful medication management, seek a course of treatment that addresses both domains. While traditional therapy is useful it is clear from the

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evidence that this type of cognitive therapy is useful in restoring patients to a more functional state. Cost is another area that may be prohibitive when thinking about implementation of a CET program. The initial startup for the proprietary software and equipment is expensive and it is possible that community partnerships are the way forward for any organization interested in starting a program of this type.

Comorbidity

One area of weakness and knowledge gap for CET and cognitive therapy is for patients experiencing comorbidity. CET therapy is an intervention deemed appropriate for people with schizophrenia who are stable on medication (Eack, 2012). Currently there are no clinical trials for patients who are not stable on medications. It is not known if cognitive therapeutic intervention could have an effect along with medication to stabilize the patient or if a patient who is not medication stabilized could attempt CET.

Another area of weakness is existing comorbidity, substance abuse in particular, but any concurrent diagnosis. Schizophrenia is a complex disorder and comorbid disorders are common. Studies limited to stable schizophrenics with no comorbid disorders is a best case scenario and with schizophrenia this is the exception not the rule. CET could demonstrate exceptional ability if not just available to those who are stable but be a part of the stabilization process. A possibility for further study is introduction of CET therapy as part of medication and other stabilization. Another potential area of study is home based therapy. It may be possible for aspects of this program to begin as part of a home based training and then the person would come to the group setting for the social cognitive group but that may require a reworking of the program.

Conclusion

Schizophrenia is a debilitating, degenerating disease that renders the person unable to function without therapeutic intervention. Medication management is the key to stabilizing the hallucinations and delusions that threaten to overwhelm the schizophrenic. Stabilization is not the only goal. Rehabilitation is the process of restoring someone to functional status. With the right treatments a patient should be able to achieve the highest quality of life that is reasonably possible and research should continue to expand that definition. CET shows promise in its ability to improve the functioning of the schizophrenic patient. Further research and practice in CET is warranted based upon the initial positive results.

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Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice
Bell, Fiszdon, Greig, Wexler, Bryson, (2007)	Application of a computer based neurocognitive enhancement therapy along with work therapy causing improvement in neuropsychological testing for participants with schizophrenia and schizoaffective disorders	Patients who have combination neurocognitive enhancement therapy (NET) with work therapy (WT) will show better outcomes on neuropsychological testing than those undergoing work therapy alone	145 participants with either schizophrenia or schizoaffective disorder were randomly assigned to either the NET with WT or WT alone group. Neuropsychological assessment was performed at baseline, 6 months, and 12 months.	NET + WT group demonstrated greater improvement in executive functioning and working memory over 12 months than WT only. NET stopped at 6 months so it may be that continued work help enhance cognitive function already enhanced by NET. WT did demonstrate improvement in memory but it maybe that NET was necessary to produce the additional improvement in executive function and working	Cognitive remediation in the context of WT may have neuropsychological benefits in executive functioning and working memory that can endure for at least 6 months after the end of training. WT alone may also foster improvement particularly in verbal and nonverbal memory.	Different doses of training and methods of maximizing motivation require testing. The clinical, quality of life, and vocational, outcomes that may result from cognitive training.	Nonspecific on implications for practice. Study is focused on the implications for future research.

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				memory			
Eack, Greenwald, Hogarty, Cooley, Dibarry, Montrose, Keshavan, (2009)	Early application of cognitive rehabilitation may afford long-term functional benefit to patients with schizophrenia	Patients undergoing CET would show improvement in neuro-and social-cognitive function when compared with patients undergoing EST.	58 schizophrenic patients were randomly assigned to a cognitive enhancement therapy or enriched supportive therapy control for two years.	After one year of treatment patients undergoing CET had significant and medium to large differential improvements in dysfunctional cognitive style, social cognition, social adjustment, and symptomatology compared the EST group. After two years this difference was greater. In particular CET showed significant medium sized improvement on the neurocognitive composite by the second year of treatment.	CET is recovery-phase treatment for the remediation of social and nonsocial cognitive deficits among stable outpatients with schizophrenia.	The early application of CET may confer substantial benefits in cognitive functioning and broad domains of outcomes for this population.	Sufficient exposure to cognitive rehabilitation may be a vital, yet over looked, component to early-intervention programs, ultimately providing critical ingredients needed to help individuals recover from the disorder.
Eack, Hogarty, Greenwald, Hogarty, Keshavan,	Psychosocial cognitive rehabilitation predict better	Cognitive enhancement therapy will improve work	58 schizophrenic patients were randomly assigned to a	Patients who had CET therapy were more likely to	CET can help facilitate employment in early	Durability of the treatment to include the generalization	CET addresses the need for both neurocognitive

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(2011)	employment outcomes in schizophrenic clients	readiness, instrumental task performance, and social and major role functioning	cognitive enhancement therapy or enriched supportive therapy control for two years. After which there employment data was collected annually.	be competitively employed, had greater earnings, and were more satisfied with their employment status by the end of treatment when compared with control.	schizophrenics by addressing cognitive impairments that limit functioning in the disorder. Inclusion of cognitive rehabilitation supports optimal functional recovery from schizophrenia	of work performance and tenure of employment	and social-cognitive improvements to increase employment outcomes and justify it as adjunct therapy to pharmacological therapy
Eack, Mesholam-Gately, Greenwald, Hogarty, Keshaven (2013)	Cognitive enhancement therapy or enriched supportive therapy improve negative symptoms along with the demonstrated improvement on cognitive function	Patients participating in CET will demonstrate an improvement in negative symptoms as a secondary benefit of the therapy	58 schizophrenic patients were randomly assigned to a cognitive enhancement therapy or enriched supportive therapy control for two years.	Results demonstrated and medium sized differential improvement in negative symptoms for patients undergoing CET but on EST; specifically social withdrawal, affective flattening, and motor retardation	The beneficial effects of CET on negative symptoms and the association between neurocognitive improvement and negative symptom change suggest an important link between cognitive enhancement and negative symptom improvement in patients with schizophrenia	There should be further trials that specifically measure negative symptom improvement of those patients undergoing CET	CET maybe a new tool to not only improve cognitive function but also give some help for the previously hard to treat negative symptoms associated with schizophrenia

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<p>Greig, Zito, Wexler, Fiszdon, Bell, (2007)</p>	<p>Application of a computer based neurocognitive enhancement therapy along with work therapy causing improvement in neuropsychological testing for participants with schizophrenia and schizoaffective disorders</p>	<p>Patients who have combination neurocognitive enhancement therapy (NET) with vocational program (VOC) will show better outcomes on neuropsychological testing than those undergoing work therapy alone</p>	<p>72 participants with either schizophrenia or schizoaffective disorder were randomly assigned to either the NET with VOC or VOC alone group for one year of training.</p>	<p>NET group showed significantly greater gains in categories measured in neuropsychological testing compared to VOC only.</p>	<p>While it there was no definitive tool to determine the cause of observed benefit a similar study using another computer based cognitive intervention showed similar results prompting this group to lean toward the computerized cognitive remediation being the determining factor</p>	<p>Sufficient evidence exists to justify the continued development and evaluation of cognitive remediation treatments. Continue to analyze the data to determine the benefit after treatment and the effect on work outcomes.</p>	<p>Study is primarily focused on research based implications.</p>
<p>Keshaven, Eack, Wojtalik, Prasad, Francis, Bhojraj, Greenwald, Hogarty, (2011)</p>	<p>Cortical reserves are a predictor of positive response to cognitive enhancement therapy</p>	<p>Pre-treatment cortical volumetric measures would predict the effects of CET on neurocognition and social cognition.</p>	<p>50 participants were chosen and randomly assigned to either the CET group or a control group. Before therapy began all participants had imaging on their brains to determine the cortical reserve</p>	<p>Pre-treatment cortical reserves were not predictive of differential neurocognitive response to CET, this indicates that all patients demonstrated similar levels of neurocognitive</p>	<p>Analysis indicates that baseline cortical reserve may predict an accelerated treatment of social-cognitive response to CET but not long term response or</p>	<p>Further study is needed to determine if CET has a larger effect on social-cognitive function than neurocognitive function. In addition further research on other methods of improving</p>	<p>CET improves cortical reserve and is protective of the baseline reserve. These factors make early therapeutic intervention desirable for newly diagnosed</p>

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			level	improvement regardless of baseline reserve. However higher baseline levels were predictive of higher social cognitive response during the first year of treatment but not second year.	neurocognitive response.	neuroplasticity along with CET	patients
McGurk, Mueser, DeRosa, Wolfe, (2009)	Randomized control trial of 34 patients with severe mental illness undergoing both cognitive remediation and vocational rehabilitation.	Combining vocational rehabilitation with cognitive remediation will have better outcomes than vocational remediation alone.	Review of research on comorbidities and cognitive function and a review of a randomized control trial of 34 patients undergoing both cognitive remediation and vocational rehab.	In the review of the research and studies it became apparent that cognitive remediation demonstrated improved functioning in areas such as verbal learning, memory, and executive functioning. However there was not an improvement in overall attention span. Participants in both remediation and	Research supports the effect of cognitive remediation improving work outcomes for those already in vocational rehabilitation. It suggests that cognitive functioning is not in itself sufficient but serves as a meaning reinforcement and supplement to additional rehabilitation types. The studies did not	The studies examined did not address the issues related to comorbidities so further research is needed. The studies also did not address work outcomes in a competitive environment that did not provide alternative employment so further study is needed in this area.	Practitioners should again consider cognitive remediation as an excellent supplement and adjutant treatment method with the understanding that it enhances other rehabilitation and therapy. Treatment of comorbidities is extremely important to success. Opportunities to meet patient needs in these

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				<p>vocational rehabilitation were able to work more hours and earn more wages than those with vocational rehab alone. Additionally the improvement shown was stronger for work than for cognitive performance overall reinforcing the link between the interventions.</p>	<p>address comorbid problems but did indicate worse outcomes for those with comorbid issues.</p>		<p>areas and contribute to the overall knowledge base are important to future success.</p>
<p>Surti, Corbera, Bella, Wexler (2011)</p>	<p>Early visual processing on computer based cognitive remediation exercises to demonstrate improved learning and information manipulation in schizophrenia</p>	<p>Improvement in visual task performance would correlate with improvement in pre-post measures of visual learning and visual memory but not with measures of auditory verbal learning or memory</p>	<p>14 adult outpatients with schizophrenia assigned to a randomized control trial of CCR (computer-based, cognitive, remediation) combined with vocational rehab</p>	<p>All 14 patients demonstrated improvement in visual memory but did not show any improvement in the other memory domains nor demonstrate an improved ability to manipulate presented</p>	<p>Exercises improving basic visual memory. This justifies their inclusion in treatment. They are not sufficient as a single therapy because it does not demonstrate improvement in other domains. Mastery of a task</p>	<p>Research into training that would specifically target manipulation of visual memory. Evaluate training during training to determine talk of training for the trained exercises. Benefits of</p>	<p>Visual processing should be part of therapy because it has benefit to the patient but it is not sufficient as the only type of cognitive remediation. Encouragement of mastery of a task is important</p>

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				information	demonstrates greater cognitive improvement than time spent with a task	cross-module training. Larger sample size to determine if results may be generalized.	because it improves cognitive function
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Table 2: Evidence Table for Cognitive Enhancement Therapy

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Manuscript 3:

Perceptions about Cognitive Enhancement Therapy among regional Mental Health Providers: a

Mixed Methods Analysis

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Abstract

Cognitive Enhancement Therapy (CET) is a program, developed at the University of Pittsburgh, to improve cognitive deficits experienced by people diagnosed with schizophrenia. Since its implementation in various settings, CET has demonstrated positive outcomes for patients in many cognitive domains. This study took a mixed methods approach to assess the interest and knowledge of mental health providers at a regional level and a local mental health facility in particular, about beginning a CET program. The quantitative study obtained data from evaluations administered during two CET training events at a local mental health facility. Digitally recorded qualitative interviews were conducted with providers and administrative staff members of a local mental health facility who attended the trainings. Qualitative data was assessed using thematic analysis of the transcribed interviews. Findings indicate that facilitators to CET implementation include the perception of need for a new therapeutic method to enhance cognition, a non-prescriptive staff desire for new evidence based practice innovations, a positive outlook for patient participation, and a current framework for analogous interventions. Barriers to implementation include the current duration of patient stay vs. the length of CET treatment (program adaptability), the current medical model employed at the local mental health facility; prescriber skepticism, logistical issues, and questions about an expanded evidence base for CET.

**Perceptions about Cognitive Enhancement Therapy among Regional Mental Health
Providers: A Mixed Methods Analysis**

Introduction

Schizophrenia is a chronic mental disorder resulting in progressive neurodegeneration throughout the course of the patient's life (Eack, 2011). Schizophrenia presents with distinct symptom sets unique for each patient but which fall within characteristic groups. The symptoms are categorized as positive, negative, and cognitive (American Psychiatric Association, 2013). Typically, a patient suffers from some combination of symptom types. Advancements in antipsychotic medications have allowed patients relief from many of the positive symptoms (e.g., delusions, hallucinations, and paranoia) and to live outside of the hospital environment.

Although medication treatment provides relief for those symptoms that fall on the positive spectrum of schizophrenia, they offer little to no relief for negative and cognitive symptoms (Eack, Hogarty, Greenwald, Hogarty, & Keshaven, 2011; Chou, Twamley, & Swerdlow, 2012). Cognitive symptoms are challenging because disordered thinking can prevent the patient from carrying out functions of everyday living. Without proper cognitive function, the patient with schizophrenia is often unable to hold a job, pay bills, or properly care for day-to-day life (Chou, et al, 2012).

There is a recent trend toward programs and studies which focus on cognitive improvement for patients with schizophrenia. An example of such a program is Cognitive Enhancement Therapy (CET) (Eack, 2011). This program has demonstrated some promise in improving cognitive functioning. The evidence suggests that programs like this offers therapeutic techniques which could be an extremely important tool for mental health professionals in

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providing treatment to patients with schizophrenia. The therapeutic goals of such programs include improvements in several cognitive domains such as memory, attention, executive functioning, or basic tasks such as early perceptual processing and working memory (Thornsen, Johansson, & Loberg, 2014; Eack, et al, 2011; Chou, et al, 2012; Kaneko & Keshaven, 2012). However, at the time of this study there is only one such program within driving distance of the area examined in this study. The aim of this study was to determine the knowledge level about CET of mental health practitioners in the local region and examine the potential facilitators and barriers to implementation of CET at the local mental health facility.

Literature Review

Therapeutic approaches

The following review of literature was performed to explore the usage and benefits of Cognitive Enhancement Therapy (CET) vs. Enriched Supportive Therapy (EST). The therapeutic interventions within each program are similar but present enough differences to warrant a brief examination of each.

Cognitive Enhancement Therapy (CET)

The University of Pittsburgh, spearheaded by the Department of Social Work and Gerard E. Hogarty in particular, developed a program of cognitive enhancement therapy (CET). The aim of this program was a dual course of treatment based on cognitive remediation using a computer-based program that improves neurocognition. While patients go through this computer-based program they also undergo individual, group, and experiential therapies addressing social cognition (Eack, et al, 2011). This treatment regimen covers domains requiring separate interventions. The treatment program consists of 60 hours of computer based training based upon

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established remediation, memory, and problem-solving software which target personal improvement in memory, attention, and problems solving. In addition, CET takes place in participant pairs with the aid of a CET coach.

The goal of this approach is for the integration of the 60 hours of computer based pair training to take place in 45, weekly, 1.5 hour social-cognitive training group sessions where participants learn social-cognitive abilities such as perspective-taking, social context appraisal, and rehearsing social cues. The participants then apply these abilities in the group setting in vivo cognitive exercises, homework, and unrehearsed social situations (Eack, et al, 2011).

Enriched Supportive Therapy (EST)

Enriched Supportive Therapy (EST) is an illness management and psychoeducational approach based on components of the basic and intermediate phases of another therapeutic approach (Eack, et al, 2011). This therapeutic approach combines individual sessions composed of two separate phases. Phase I focuses on basic psychoeducation about schizophrenia, the role of stress in the disorder, and ways to avoid or minimize stress. Phase II individuals learn more about identification and management of stressors which pose particular challenges to their own social and role functioning. Some examples of the techniques include identification of early warning signs of stress and psychotic relapse, diaphragmatic breathing, healthy passive and active relaxation strategies, pro-social behavior, and conflict avoidance. No area of EST is specifically designed to address employment although methods of managing stress related to employment were taught to individuals who expressed employment as a goal (Eack, 2011). This group served as the control group for study used in three of the articles (Eack, et al, 2010; Eack, et al, 2011; Eack, et al, 2013).

Computer-based cognitive remediation, Neurocognitive Enhancement Therapy, Vocational training

CET is a specific therapeutic treatment program but it is not the only targeted cognitive remediation for patients with schizophrenia. A small (sample of 14 patients) study from Yale implemented a computer-based cognitive remediation (CCR) aimed at improving cognitive visual memory (Surti, et al, 2011). This program demonstrated improvement in visual learning for the patients involved.

A program implemented at Yale randomly placed patients into a program of either Neurocognitive Enhancement Therapy (NET) and vocational training or vocational training alone. NET is a computer based cognitive enhancement program aimed specifically at workplace related cognitive issues focusing on improving attention, language, memory, and executive functioning (Greig, et al, 2007). NET includes social information processing and a work feedback group. Data analysis showed higher standardized scores for those with NET and vocational training than vocational training alone (Greig, et al, 2007). Using another approach a 3-month trial of 42 patients used various training methods (a form of teach back, inductive reasoning exercises, compensatory strategies, and work in memory enhancement) to facilitate cognitive improvement and emotional perception (van der Gaag, Kern, van den Bosch, & Libermann, 2002).

Recovery domains

Studies of therapeutic cognitive interventions identified specific areas of cognitive remediation and rehabilitation. The articles separated the recovery areas into two broad

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categories: neurocognitive and social cognitive (Eack, et al, 2011; Thorsen, et al, 2014; Eack, et al, 2011; Chou, et al, 2012; Kaneko & Keshaven, 2012).

Neurocognitive

Neurocognitive recovery is demonstrated recovery in the areas which support the higher areas of thinking and reasoning. Supportive cognitive areas include verbal memory and attention (Eack, 2012). Cognitive remediation, specifically computer based cognitive remediation, have statistically significant effects on neurocognition when compared to supportive but non-cognitive focused therapeutic interventions (Eack et al, 2011; Surti, et al, 2011; Kaneko & Keshaven, 2012).

Patients in CET demonstrated improvement in simple reaction time, choice reaction time, and visual-spatial scanning compared with EST (Eack, Greenwald, Hogarty, Cooly, DiBarry, Montrose, & Keshaven, 2009). They also demonstrated improved verbal and working memory along with better executive functioning, language ability, psychomotor speed, and neurological soft signs compared to the EST group (Eack, et al, 2009). When taken as part of an aggregate score these results suggest that the computer based cognitive remediation maybe the most important factor in neurocognitive improvement (Bell, et al, 2007; Eack et al, 2011; Surti, et al, 2011; Kaneko & Keshaven, 2012).

Social Cognitive

Social cognitive improvement facilitates and improves interactions and interpersonal relationships (Eack, 2012). A variation on this is vocational improvement (Greig, et al, 2007). Although a separate domain from social cognition there is enough overlap to justify addressing vocational improvement. Results from one study demonstrated vocational improvement even

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when vocational rehabilitation was not a focus of the program (Eack, et al, 2011). In the Eack, et al, (2011) study patients in a CET program focused on social-cognitive groups by: responding in unrehearsed social exchanges, presenting homework, participating in cognitive exercises that focus on experiential learning, providing feedback to peers, and chairing homework sessions (Eack, 2011). The goal of the program is to teach adaptation in social situations which is why they are able to cope with work stress and situations without specific vocational training. CET participants would set goals before the program and could state employment as a goal but there was no specific program tailoring (Eack, 2011).

When paired with interventions aimed at neurocognitive improvement, social cognitive and vocational rehabilitation programs were significantly more successful. Using employment as a standard, those who went through a program that addressed both neurocognitive remediation and vocational rehabilitation were able to work more hours and earn more salary than those who had only undergone traditional therapy (McGurk, Mueser, DeRosa, & Wolfe, 2009; Greig, Zito, Wexler, Fiszdon, & Bell, 2007).

Individuals in the CET study group were more likely to obtain new employment than those in EST group (54% vs 18%), they were more likely to maintain employment (54% vs 18%), and they were more likely to gain skilled employment (39% vs 18%) (Eack, 2011). Those individuals also had higher reported earnings and job satisfaction scores and found the CET group scored higher with statistical significance ($p=.044$; $.009$) (Eack, et al, 2011).

Social cognitive functioning showed similar results to vocational rehabilitation outcomes; there was significant improvement with combination neurocognitive and vocational therapy (McGurk, et al, 2007; Greig, et al, 2007, Kaneko & Keshavan, 2012; Surti, et al, 2011).

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In the McGurk et al. (2007) study, patients who attended a computer based cognitive training and vocational rehabilitation worked more internship hours and earned more wages upon comparison of Mann-Whitney U tests than vocational rehabilitation alone.

The evidence gathered during the literature review presents a compelling case for further examination of computer based cognitive therapeutic intervention for patients with schizophrenia as a means of recovery. This region as of the study date has no program implemented.

Project Overview

This study used a mixed-methods approach to examine the following research questions:

1. Research question Quantitative: Does participation in CET training increase knowledge and encourage implementation by mental health providers in the state in which the study was conducted?
2. Research Question Qualitative: What are the perceptions of the participants related to barriers and facilitators for implementation of a CET program in the study region?

The quantitative portion used data obtained from pre-and post-training surveys given to participants who attended the two training sessions offered on April 12th and 13th, 2016. The qualitative portion of the study obtained data in face-to-face interviews conducted with voluntary participants based upon a standard set of questions.

Methods

Study Design: The study used a descriptive design to examine the research question. The quantitative study was conducted using pre-and post-training surveys included in the education packets provided to all registered participants of the CET lunch and learn on April 12th and the full educational workshop on April 13th. It was noted if participants attended either both days or

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only one day. The survey data collected was completely anonymous but did collect basic demographic information including sex, profession, and years in practice.

A qualitative study was conducted 14 months after the training sessions using face-to-face interviews to examine the perceptions of key stakeholders about CET and to identify facilitators and barriers to its implementation at a local mental health facility.

Sample: The sample for the quantitative portion of the study consisted of 44 staff members and providers who participated in the ‘Lunch and Learn’ and 51 participants in the workshop. A convenience sample was used. The sample for the qualitative portion of the study consisted of 5 practitioners and administrators who participated in the training.

Inclusion and Exclusion criteria: The inclusion criteria were that the participants should be employed at the regional mental health facility as either a mental health practitioner (including nursing, psychology, and social work) or administrator, attended the CET training, and be willing to participate in audio-taped interviews.

Human subjects protection: A waiver of informed consent was provided by the Institutional Review Board of the sponsoring University for the quantitative portion of the study. All participants in the qualitative portion of the study provided informed consent before the interviews. The Institutional Review board approved all study materials and measures to maintain confidentiality were maintained throughout the study. The participants were de-identified and assigned numbers 1-5.

Instruments: Quantitative data were collected using two, (pre- and post-) one 10 item and one 13 item, Likert scale survey that assessed basic demographic information about the training participant including gender, race, and profession. A pre- and post- training survey was

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used to measure knowledge of the topic of the training. Survey items are identified in Appendix B and C. Response choices ranged from strongly disagree (lowest response choice) to strongly agree (highest response choice). Scores ranged from 1 to 5, with higher scores indicating a higher level of agreement. The final three items on the post survey evaluated the training, trainer, and allowed for comments.

Qualitative data were collected using a semi-structured interview guide. It included 20 questions that addressed the individual's current profession, their number of years in their profession, their current role in their organization, their individual thoughts, attitudes, and beliefs about CET in general and implementation of CET in this region in particular. The interview guide is displayed in Appendix A.

Data Collection

Quantitative survey data were collected at the beginning and end of each training session. Five to ten minutes were given at the beginning of each session to allow participants to complete the pre-training survey; and time was allowed at the end of the sessions for completing the post-training survey. All training attendees did not complete the pre-and post-training surveys but participation represented a substantial portion of attendants at the 'lunch and learn' and the workshop.

Qualitative data were collected through semi-structured interviews conducted with the participants to determine the facilitators and barriers to implementation in a local facility. The principle investigator conducted the interviews; interviews were audio-taped, notes taken in a field journal, and transcribed for the purposes of data analysis. Interviews lasted approximately between 30 and 45 minutes in length.

Data Analysis

Quantitative data were entered onto a Microsoft Excel spreadsheet for the purpose of analysis. Data analysis was conducted using SPSS statistics software. Descriptive statistics for the demographic data utilized the *Chi*-square test to examine differences between pre- and post-test participants statistical significance. The survey questions were analyzed using independent *t*-tests and made use of Levene's test for equality of variance where appropriate to examine differences in pre- and post-test main outcomes of interest.

Qualitative data analysis was conducted by qualitative content analysis which involved a review of participant narratives. Relevant statements were organized into smaller units which were identified by key words. These key words were identified by repetition in answers by multiple participants to the same question. These were then examined for similar themes which were then used to group the statements. Once the themes had been identified each theme was categorized as either a facilitator or a barrier to implementation of CET.

Data Trustworthiness

Investigators employed multiple strategies to ensure data validity and reliability. Triangulation was a priority to promote credibility of study findings. For example, the quantitative survey data allows for an objective measure of participant's baseline knowledge and attitudes toward CET prior to training intervention. The interviews were audio recorded with notes taken in a field journal, reviewed and then transcribed to ensure accuracy and understanding of participant answers. Peer review among members of the research committee occurred to ensure accuracy of both quantitative and qualitative findings and interpretation.

Findings

Quantitative Results

Sample Characteristics

The Lunch and Learn training sample was primarily female (83.3%), white (81.2%), and of the counseling disciplines (58.1%). The majority of participants have worked greater than six years (52.9%). In addition, in the workshop participants were primarily female (75.8%), white (80.2%), and of the counseling discipline (73.1%). The majority of those attending the workshop had worked for five years or less (54.9%). There were no significant demographic differences in the samples responding to the pre- and post- surveys for both the Lunch and Learn and workshop (see Table 1). However, 47.3% of those who attended the workshop also attended the Lunch and Learn.

Changes in knowledge for Lunch and Learn and Workshop

Lunch and Learn:

Before the Lunch and Learn the average rating of having a good understanding of cognitive dysfunction in mental illness was 2.36 (SD=.89). After the Lunch and Learn the average rating of having a better understanding of cognitive dysfunction in mental illness was 3.30 (SD=.64). The finding of a better understanding of cognitive dysfunction in mental illness after the lunch and learn was statistically significant. In a similar fashion, the average scores on knowledge about cognitive recovery strategies and familiarity with CET were 2.02 (SD=.82) and 1.55 (SD=.88), respectively. The average ratings in having more knowledge about cognitive recovery and more familiarity with CET were 3.26 (SD=.58) and 3.35 (SD=.53), respectively. In addition, average scores on the use of CET in practice and the evidence base to employ CET on a

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wide scale were quite low ($M=1.41$ [$SD=.90$] and $M=1.57$ [$SD=.76$], respectively). There were significant increases in knowledge regarding the differences between neurocognitive and social cognitive function (see Table 2).

Workshop:

Before the workshop the average rating of having a good understanding of cognitive dysfunction in mental illness was 2.98 ($SD=.62$). After the workshop, the average rating of having a better understanding of cognitive dysfunction in mental illness was 3.29 ($SD=.84$). The finding of a better understanding of cognitive dysfunction in mental illness after the workshop was statistically significant. Similarly, the average scores for knowledge about cognitive recovery and familiarity with CET were 2.43 ($SD=.86$) and 2.22 ($SD=.97$) respectively. After the workshop, the average ratings in having more knowledge about cognitive recovery and more familiarity with CET were 3.26 ($SD=.89$) and 3.21 ($SD=.75$) respectively. The average scores on use of CET in practice and the evidence base to employ CET on a wide scale were also low ($M=1.43$ [$SD=1.0$] and 1.45 [$SD=.81$], respectively). There were significant increases in knowledge regarding the differences between neurocognitive and social cognitive function (see Table 2). A note on the item “cognitive functioning is an important part of recovery,” the scores on this item were high relative to the other items on this survey. There seems to be broad agreement that cognitive functioning is important part of recovery and this was further explored in the qualitative interviews.

Satisfaction with Lunch and Learn and Workshop

After the lunch and learn the mean rating on intending to use CET in practice was 2.56 ($SD=.67$) and desire to seek more information on CET was 3.26 ($SD=.54$). In addition, of those

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who completed the post-test survey, 90.7% rated the overall training as good or excellent and 100% rated the trainer as good or excellent. After the workshop, the mean rating on intending to use CET in practice was 2.51(SD=.78) and desire to seek more information 3.10 (SD=.73). Of those who completed the workshop posttest survey, 85.7% rated the overall training was good or excellent and 90.5% rated that the trainer was good or excellent.

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Table 1: Sample Demographics

	Pretest		Posttest		Chi-square(df),p-value
	n	%	n	%	
<i>Lunch and Learn Sample</i>					
Female	36	83.7	34	82.9	.01(1), .922
White	36	81.8	33	80.5	.03(3), .999
Discipline					.45(4), .978
Counseling	25	56.8	25	59.5	
Nursing	6	13.6	6	14.3	
Physician/APP	3	6.8	3	7.1	
MHA	5	11.4	5	11.9	
Other	5	11.4	3	7.1	
Work Tenure					.04(3), .998
Less than 1 year	8	18.2	7	17.1	
1-5 years	13	29.5	12	29.3	
6-10 years	10	22.7	10	24.4	
More than 10 years	13	29.5	12	29.3	
<i>Workshop Sample</i>					
Female	38	76.0	31	75.6	.00(1), .965
White	40	80.0	33	80.5	.78(2), .674
Discipline					2.30(4), .681
Counseling	36	70.6	32	76.2	
Nursing	5	9.8	4	9.5	
Physician/APP	4	7.8	1	2.4	
MHA	5	9.8	5	11.9	
Other	1	2.0	0	0.0	
Work Tenure					1.06(3), .786
Less than 1 year	12	23.5	10	23.8	
1-5 years	14	27.5	15	35.7	
6-10 years	13	25.5	10	23.8	
More than 10 years	12	23.5	7	16.7	

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Table 2. Changes in CET knowledge scores from Pre to Posttest

	Pretest		Posttest		T(df),p-value
	M	SD	M	SD	
<i>Lunch and Learn (N=44)</i>					
I understand the differences in neurocognitive and social cognitive function.	2.27	.92	3.09	.65	4.80(77.15), <.0001
I believe that cognitive function improves with improvement of other symptoms of mental illnesses.	2.89	.78	3.05	.98	.85(85), .400
Medication management will improve cognitive function.	2.77	.83	2.72	.96	.27(85), .788
Negative symptom improvement is not related to cognitive improvement.	1.42	.91	1.28	1.16	.62(84), .536
Cognitive improvement is an important part of recovery.	3.45	.70	3.65	.61	1.40(85), .166
<i>Workshop(N=51)</i>					
I understand the differences in neurocognitive and social cognitive function.	2.55	.83	3.24	.66	4.47(90.84), <.0001
I believe that cognitive function improves with improvement of other symptoms of mental illnesses.	3.10	.78	3.21	.84	.69(91), .492
Medication management will improve cognitive function.	2.96	.66	2.86	.75	.71(91), .481
Negative symptom improvement is not related to cognitive improvement.	1.22	.88	1.19	1.15	.12(91), .905
Cognitive improvement is an important part of recovery.	3.57	.50	3.62	.49	.49(91), .627

Notes: Differences between groups were based upon independent sample t-tests and Levene's test for equality of variance

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Qualitative Results

The qualitative interviews provided information from practitioners and administrators about facilitators and barriers that the organization might face if they choose to implement a CET program. In general, the participants recognized the need for change in the organization to improve patient outcomes. Facilitators to implementation identified by the participants were: a desire to implement evidence based practice and a search for the best evidence based interventions; participants further had a positive perception about patient participation, facilities which have some analogous systems and programs in place. Barriers to implementation identified by the participants include duration of patient stay vs. duration of the CET intervention, the perception of the medical model at the hospital vs. a recovery model, and some logistical issues.

Need for change

A consistent theme between each interview participant was the need for a change in practice and culture at the hospital. The interview participants spoke about their desire to attend the CET training to gain more knowledge and insight into where the research was going:

CET is an alternative treatment and a way to treat from a holistic stand point. We treat the body with medications but we need help in the area of group and alternative interventions at (the facility).

I can say there needs to be an alternative intervention under the umbrella of evidenced based practice implemented.

The interview participants expressed a readiness to move away from a medication only intervention model and move toward one that is more recovery focused.

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Evidenced Based Practice

The desire for change comes along with a desire to implement change based upon evidence based practice (EBP) solutions. This applies not to just CET in particular, but the theme of change in practice, in general:

I attended the CET training because I am seeking out EBP that could impact the population and I wanted to know more.

Right now mental health is hot because of parity laws and unbiased laws. Organizations are getting excited about it. Mental health has existed at the edges of nursing and we have to strive to EBP models, use research, and employ strict standards. This seemed like a good opportunity for expansion to new interventions.

The staff is looking for new evidenced based ways to serve the patient population beyond the normal medical model. The atmosphere of readiness for change and staff search for new and innovative EBP foster an environment where new program implementation maybe possible.

Patient involvement

Participants also agreed that patients would be open and even enthusiastic to participate in a CET program if one began in the local area:

I feel like patients would participate, I absolutely do. Patients feel like they are being housed here not treated. They would be curious, especially if staff were involved and engaged.

Patients are open to classes, the majority are.

When you think about CET, I think they would embrace it because, they know that meds work but they are looking for alternative support or further help with patients who are not med compliant.

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Patients generally respond well to something new and fun.

CET properly introduced and implemented would be an attractive alternative treatment for many of the patients. These quotes are particularly enlightening in light of the next facilitator: analogous systems already in place.

Analogous Systems-similar interventions already offered

A local facility has an area with access to a variety of activities addressing areas of patient need. This is an area that houses programs which are focused on holistic wellness and recovery. It offers an opportunity for enrichment for the patients. The existence of this area in the mindset of the population was a positive facilitating factor for the interview participants:

Patients respond well to our recovery mall, I think this would be similar. Seeing this as another opportunity to gain something from this technology would make it attractive.

It involves group, individual, and computer based training; it is similar to the (enrichment center).

Easiest part (of implementation) is some already available resources and some structures in place that could facilitate.

With systems already in place it should help with the implementation of another program.

Duration of stay vs. Duration of program

The most frequently voiced barrier to CET at a local facility was the difference between the average patient stay and the length of the program:

Length of program vs. length of stay (is a concern). You need say 30 sessions for the program and patients on my units have a 10 day average length of stay.

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*Time component for staff and patient population is a barrier. No predictable length of stay.
Frequent utilizers could benefit but it is a significant time investment.*

Time of program is a legitimate concern and does present a barrier to implementation. Any implementation of CET would have to find a way to work around this substantial barrier.

Medical vs. Recovery model

The interview participants were all non-prescriptive providers. This is important because of another theme that they identified, the need to move from a medical model to a recovery model. The sense from the majority of those interviewed is that the facility exists to give medication:

From a nursing standpoint we give meds, we rely on those as the primary was; CET as an alternative or supplement to what we are doing could be a help.

Medical staff perceives meds as the primary, if not only, intervention; clinical staff knows that there are solid psychosocial interventions. We are medically driven model.

Medication providers make referrals so they would have to be on board; the rest just need to know the results.

The main point here is that nonmedical staff has, at least a perception, of not being as valued when it comes to treatment interventions. This model, and emphasis on medication, informs how clinical decisions are made and would impact any implementation of a long term program:

Time and resources dictate treatment; stabilize patients as soon as possible.

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I don't know how providers would respond, some have been here for 10-15 years, and some new so it is going to depend on individual mindset. If a provider believes in alternatives they would embrace.

Logistical concerns

Along with some of the concerns about the environment of care participants had concerns about the basic logistics of implementation. The first concern was staffing. Participants were unclear about any new program and who would be needed to staff that program:

Staff training and staff dedicated to groups, committed to this practice could be a problem.

Here at the hospital we are 24-7 but other areas are Monday-Friday 7-5, this could be a problem.

Census and max capacity, we can barely get the nuts and bolts accomplished, budget, max staff but need more beds. There is a lack of funding.

The concern is that a hospital already under a staff burden may not be able to support a longer-term program with the existing staff. Additional staff concerns highlighted a second common concern: budget:

Budget and a culture of not wanting to change. If it is not broke don't fix it.

We have the same issues that many state facilities have, budget deficits, getting all staff on the same page to come together and sometimes we are not good at that.

Recommendations

The participants' answers served as the basis for identifying facilitators and barriers but also provided some direction for action. During the interview process the participants noted the desire for EBP interventions. When asked specifically about CET as the specific implementation of EBP participants had some questions:

There is interest (in CET) but more EBP needs done, cost benefit analysis, I am kind of on the fence. We need to look at practice changes and how you can do that. How do you do that in 2-3 weeks? We have (a regional) recovery center but not everyone has that. We may need a partnership.

Most (hospital staff) are not well informed about CET or benefits.

Interest is tricky, we have interest in EBP models and CET looks like it has an evidence based approach but what about in this setting, does it need adaptation.

I need to see data and outcomes for this specific population. We have a diverse mix of those with serious mental illness but also dual diagnosis. We don't have a triage so we get everything, a judge could send someone to us without warning.

These quotes provide a roadmap for making a case for implementation. The environment is ripe for solid evidence based intervention but the barriers in place make it important that the right intervention is chosen. Demonstrated outcomes, particularly showing decreased readmission rates, would be sufficient for the participants to justify implementation of a CET program:

Anything that we can do is a benefit, even if cost is great, if it could decrease readmission, and help employment, I would love it.

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I would like to see an increase in our evidenced based outcomes as a whole get better and decrease our readmissions. CET adapted to our population or a targeted population.

If CET can demonstrate meaningful change, and for these participants hospital readmission rate decrease is important, then the expense could be justified based upon the outcomes.

Discussion

Participants in both the training sessions and the interviews participated because of a desire to learn and find better evidence based interventions for the patient population. Findings from the quantitative survey data suggest that there is a knowledge gap about CET among providers in this region. With that gap in knowledge there is also an absence of CET in practice or plan to implement CET in practice. However, the survey response to the training and the report of an increase in knowledge both of cognitive dysfunction in mental illness and CET in particular suggest openness to new practice options with the proper evidence base.

In the qualitative portion of the study, all the interview participants expressed the need for more evidenced based practice solutions and indicated their attendance of the CET training came as a consequence of this desire:

No, not at all (speaking about mandatory training attendance), we didn't force anyone; we did our normal marketing and were impressed by the turnout.

I believe the interest is there in starting a CET program, which is why I attended.

Data gathered from the interviews indicate a positive outlook for new practice in general and CET in particular.

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However, the data indicate that complete implementation of a CET program may not be possible at this time. Instead the best course of action is to follow where the data lead. In this case it is pointing to creation of a systemic change in the culture. For implementation to be successful everyone as a whole would need to embrace the change:

...that would help people see us as a hospital that can help people recover.

This would mean committing to a singular goal, for the appropriate population, with a treatment team committed to attaining the goal for the patient. Implementation of a CET program would require a significant investment of time, finances, and resources. Initial data indicate that many at this facility are ready to make that commitment on behalf of evidence based practice but the culture would need to change in favor of a recovery model and CET for this to happen.

The APRN with a DNP can be the agent of change in this situation. The Essentials of Doctoral Education for Advanced Practice Nurses (American Association of Colleges of Nursing, 2006) provides a framework for moving forward with change. The DNP nurse understands the value of Essential III, evidenced based practice, and Essential I, the scientific underpinnings for practice. This nurse advocates for best practice, but stress that best practices occur within the nursing paradigm and context. This means taking a holistic view of the patient. Holistic treatment drives what the interview participants were advocating for in the recommendations: interprofessional collaboration, Essential VI. DNP nursing takes interprofessional collaboration as the basis for best practice. CET is a program that focuses on recovery and exists as part of a larger treatment regime which makes interprofessional collaboration essential for the health of the patient.

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Another area that can be addressed by the APRN is in the role of practitioner, Essential VIII. By being in direct care the APRN is the person making referrals and recommendations for therapeutic interventions. The APRN in this role who is well informed of the evidence can advocate for CET for the patient as the best method for recovery.

None of this is possible without leadership, Essential II. Part of the creation of the DNP was to foster leadership in academic and clinical settings. Nursing, and the emphasis that nursing places on being holistic, is placed as the bridge between the medical and recovery model. The DNP nurse practitioner should have a solid understanding of medication interventions as a stabilizing factor and evidenced based therapeutic interventions which lead to improvements in patient quality of life and recovery. DNP leadership may be essential to fostering the change necessary for the culture to allow for implementation of a program like CET in this region.

Implications for Nursing Practice, Education, and Research

The aim of this study was to examine attitudes and perceptions about CET in the region of the state in which the study was conducted. One implication of the study is that for CET to be successful in this region more education about CET for providers is necessary to influence the use of CET in practice; as demonstrated by the increase in knowledge from the survey data. One training program over two days is insufficient to foster the kind of change needed to influence a cultural shift. Nurses, in their role as educators, can become advocates for the training. This role can become a dual advocacy role based upon the suggestion of some of the interview participants:

I would encourage patients (to attend CET), I would refer to it if it was outpatient.

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We need to look at practice changes. How do we do that? How do you do that in 2-3 weeks. We do have (regional recovery) Center but not everyone does. We could use a partnership.

Budget may be an issue as well but we have ways to reduce costs through cost sharing.

Nursing can fill the role of education and advocacy acting to help build the knowledge base and then forge partnerships which will allow for implementation.

One other area identified is the need for further evidence. After implementation, nursing could partner with a multidisciplinary team to continue to evaluate outcomes and expand the evidence base. In doing so it could meet one of the concerns expressed during the interviews:

We need good outcomes evaluated at various points, I have questions about some of the internal CET measures, there is a need for psychological testing, standard assessments, along with embedded assessments. I wasn't overwhelmed by the data, you need more measures and multiple data points over time.

Nursing should be part of the research process moving forward helping with program planning and evaluation based upon the evidence in partnership with a culture dedicated to recovery and implementation of evidenced based practice.

Conclusion

Cognitive Enhancement Therapy is relatively unknown in this region of country. There is a need for further education to attempt implementation. In addition, there is a need to expand the evidence base beyond what exists and to invite other disciplines to develop tools or to use their own measures to continue to expand the evidence base to satisfy the need for evidence in practice. The study points toward a willingness to embrace a culture of change and a need for

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new and exciting evidenced based interventions from both the staff and the patients. One possible next step could be to seek out community partners and to develop a program that could both expand the evidence base and serve as the alternative therapeutic route that interview participants view as a needed component of treatment going forward.

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Final Practice Inquiry Project Conclusion

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Conclusion

The American Association of Colleges of Nursing, in October 2006, published a document outlining the way forward for graduate nursing education. The major purpose of this document was to draw a distinction between the traditionally researched based Ph.D. and the clinically focused DNP. It would move further and define what were referred to as the “essentials” of the Doctor of Nursing Practice degree (American Association of Colleges of Nursing, 2006). These essentials became the cornerstone for graduate practical nursing education as the discipline moved from a master degree based discipline to doctoral based. Practical doctoral nursing education, rather than focus on knowledge gathering or generating research, instead focuses on practice application or integration projects (AACN, 2006). These projects are the culmination of the DNP program by demonstrating the doctoral prepared advance practice nurse ability to understand and apply the AACN DNP essentials. A true test of the academic rigor of the Doctor of Nursing Practice degree is the ability of those educated in the discipline to apply the principles practically and generate projects that will further patient care and the nursing discipline.

The first manuscript is a review of horizontal violence among nurses with a particular emphasis on the importance of communication as the way to improve nursing relationships and to foster multidisciplinary and interprofessional collaboration, which are essential to doctoral nursing education. The communication piece is the most important finding in the manuscript. It demonstrates the need for both effective and meaningful communication between nurses and other disciplines to improve patient outcomes. This practice inquiry project is based upon effective multidisciplinary collaboration and interprofessional communication.

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The second manuscript is a literature review of Cognitive Enhancement Therapy which is an essential step in any evidenced based intervention. If an evidence base does not exist, then an intervention is not worth pursuing. An investigation of cognitive remediation in general and CET in particular demonstrated a small but growing evidence base for an intervention in the early stages of development. Although some limitations exist, the limited but growing number of randomized control trials are one example, the literature review presented a compelling case for further investigation of CET implementation in the regional mental health population.

The practice inquiry project continued from the literature review by examining the mental health providers in a region and the perceptions about CET. The educational opportunities provided to providers of all disciplines showed how effective communication and collaboration could be when placed into practice. Participants had a statistically significant gain in knowledge about CET after the intervention. The interview process demonstrated a remarkably similar view among a diverse group of participants further demonstrating the importance of communication and collaboration in furthering outcomes and improving practice. It became clear that the particular mental health facility examined may not be the right setting but the providers have a significant interest in evidence based practice and alternative treatment modalities. Treatments with an evidence base and demonstrated outcomes are in the best interest of the patient and facility for implementation. One possible solution is a partnership with a community partner which would be better equipped to handle this type of program.

Schizophrenia is a lifelong disorder that a person lives with. Medication advances have improved symptomology but leave gaps in functional recovery. The opportunity exists for the mental health providers in the area to improve functional outcomes through evidenced base means. A reasonable next step would be to perform a similar study in the community to

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determine community mental health provider knowledge level about CET and perform interviews with providers to determine similar community facilitators and barriers to implementation.

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Appendix A

Interview Questions

- 1) What is your role at (regional mental health facility)?
- 2) How long have you been in your current field?
- 3) How long have you been in your current role?
- 4) Why did you attend the CET training?
- 5) What did you hope to gain by attending the training?
- 6) What about CET made you interested in the program?
- 7) Do you believe there is interest in starting a CET program at (regional mental health facility)? Why or why not?
- 8) Would you personally like to see a CET program at (regional mental health facility)? Why?
- 9) Do you believe staff at (regional mental health facility) is well informed about CET and its benefits?
- 10) What do you think is the largest barrier to overcome to implement a CET program?
- 11) What is the biggest systemic barrier you anticipate?
- 12) What would be the easiest part of implementing a CET program?
- 13) How do you think providers will respond to CET implementation?

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- 14) Would you anticipate resistance from providers?
- 15) How do you believe patients would respond to CET implementation?
- 16) Do you believe patients would participate in the therapy?
- 17) What role do you see for family in the CET program?
- 18) What are some logistical problems a potential CET program would encounter?
- 19) Would you recommend your clients to a CET program (or for unlicensed personnel would you help with a CET program)?
- 20) What are your expectations for a CET program?

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Appendix B

Pre-Test Training Evaluation Form

I am a: Social Worker Psychologist Counsellor Nurse

Advanced Practice Provider Medical Doctor Other _____

Years in practice: less than 1 1-5 5-10 More than 10

Gender: Male Female

Ethnicity/Race: White/Caucasian Black/African American Hispanic Other _____

Please respond to your level of agreement to the items listed below.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I have a good understanding of cognitive dysfunction in mental illnesses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I understand the differences in neurocognitive and social cognitive function.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I believe that cognitive function improves with improvement of other symptoms of mental illnesses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Medication management will improve cognitive function.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Negative symptom improvement is not related to cognitive improvement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Cognitive improvement is an important part of recovery.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I am knowledgeable about cognitive recovery strategies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I am familiar with cognitive enhancement/remediation therapy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I use cognitive enhancement/remediation therapy in my current practice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. There is not enough evidence base to employ cognitive enhancement/remediation therapy on a wide scale.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

THANK YOU FOR YOUR PARTICIPATION!

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Appendix C

Post Training Evaluation Form

I am a: Social Worker Psychologist Counsellor Nurse
 Advanced Practice Provider Medical Doctor

Other _____

Years in practice: less than 1 1-5 5-10 More than 10

Gender: Male Female

Ethnicity/Race: White/Caucasian Black/African American Hispanic
 Other _____

Please respond to your level of agreement to the items listed below. As a result of this training/workshop,

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I have a better understanding of cognitive dysfunction in mental illnesses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I understand the differences in neurocognitive and social cognitive function.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I believe that cognitive function improves with improvement of other symptoms of mental illnesses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Medication management will improve cognitive function.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Negative symptom improvement is not related to cognitive improvement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Cognitive improvement is an important part of recovery.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I am more knowledgeable about cognitive recovery strategies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I am more familiar with cognitive enhancement/remediation therapy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I intend to use cognitive enhancement/remediation therapy in my current practice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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10. I will seek more information about cognitive enhancement/remediation therapy.

11. **How do you rate the training overall?**

Excellent Good Average Poor
Very poor

12. **How do you rate the Presenter, Ray Gonzalez, LISW?**

Excellent Good Average Poor
Very poor

13. **What aspects of the training could be improved?**

THANK YOU FOR YOUR PARTICIPATION!

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