ISSUES IN RURAL PEDIATRIC PRIMARY CARE

by

Christine E. W. Borst

June, 2013

Director of Dissertation: Jennifer Hodgson, PhD

Department of Child Development and Family Relations

Children in rural areas experience health disparities above and beyond their urban and suburban counterparts. In order to explore the needs of children and their families in rural health care settings, two research articles were completed: (a) a systematic literature review used to explore brief interventions for use in pediatric primary care and (b) a descriptive cross-sectional study done to analyze the influence of parental biopsychosocial characteristics on child health care utilization. The systematic review revealed a considerable need for empirically supported biopsychosocial brief interventions designed for use with under-served, rural children and their families. The research study revealed a relationship between parent biopsychosocial characteristics (e.g., mental health quality of life) and child health care utilization (both acute and non-acute) in a rural southeastern community health clinic; relationships were also identified between child medical chart diagnoses (e.g., asthma, depression, obesity) and parental scores on biopsychosocial measures. Recommendations developed from both articles are extended for clinicians, researchers, and policy makers who care about the needs of the rural and under-served children and families. Specific recommendations are also made for those who employ a relational lens to their research and who practice from a Medical Family Therapy orientation.

ISSUES IN RURAL PEDIATRIC PRIMARY CARE

A Dissertation Presented to

The Faculty of the Department of Child Development and Family Relations

East Carolina University

In Partial Fulfillment of the Requirements for the Degree

Doctor of Philosophy in Medical Family Therapy

by

Christine E. W. Borst

June, 2013

ISSUES IN RURAL PEDIATRIC PRIMARY CARE

By

Christine E. W. Borst

APPROVED BY:

DIRECTOR OF
DISSERTATION: ______________________________
Jennifer Hodgson, PhD

COMMITTEE MEMBER: ______________________________
Angela Lamson, PhD

COMMITTEE MEMBER: ______________________________
Jason Brinkley, PhD

COMMITTEE MEMBER: ______________________________
Tom Irons, MD

INTERIM CHAIR OF THE DEPARTMENT OF CHILD DEVELOPMENT AND FAMILY RELATIONS:

____
Sharon Ballard, PhD

DEAN OF THE GRADUATE SCHOOL: ______________________________
Paul J. Gemperline, PhD

DEDICATION

To you, whose name I don’t yet know, and whose face I haven’t seen. You have guided me over the past eight months with gentle reminders (and sometimes less-subtle kicks) that I needed to keep working, that it was nearly time to finish this dissertation and move on to the next phase in my life. This is for you, who I have wanted long before I knew I wanted a PhD, long before I was thinking about graduate programs or future careers. Just as my title will change with the completion of this dissertation, another new title, the most important title I will ever be given, will be added in just a few short weeks, when I become your Mommy. To my child, this dissertation is for you.

ACKNOWLEDGEMENTS

First, I would like to thank my dissertation chair and major professor, Dr. Jennifer Hodgson. She has been an incredible support during the last three years, pushing me in a myriad of ways to become the best researcher, clinician, presenter, and collaborator I can be. She has truly been a cheerleader with my best interests at heart. Second, I would like to thank Dr. Angela Lamson, who is both program faculty and a committee member. Angela has been another cheerleader in my corner throughout the program, and has been so passionate about the research on which I have been working. Dr. Jason Brinkley has been an incredibly helpful addition to my committee, patiently discussing statistics and helping to mold the final project into what is written here. I am thankful to Dr. Irons, the final member of my committee, for always bringing cheer and enthusiasm to committee meetings, and whose passion for children and integrated care is contagious.

I have been so blessed to have worked with so many wonderful people at Pamlico Community Health Center in Bayboro, NC – I would not be here today without the support, encouragement, and laughter from the providers and staff at the clinic. I have truly enjoyed the nearly two years we have worked together, and consider you all such good friends. I am also so thankful for the patients and their families who I have worked with at Pamlico, who have inspired this dissertation and taught me so much about doing integrated pediatric primary care.

Finally, I am thankful for my friends and family and their guidance in this process. I am so fortunate to have such wonderful parents, who have always supported my crazy dream of getting a PhD. And last, but certainly not least, I am so grateful to my incredible husband, best friend, and partner in crime, Greg, who has remained by my side and been with me through every moment of the last three years in the program. Your unwavering love, support, and encouragement have gotten me through. I look forward to our next big adventure.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER TWO

CHAPTER THREE

CHAPTER FIVE

LIST OF FIGURES

CHAPTER TWO

PREFACE

This dissertation is comprised of six chapters that address the broad domain of working with children and their families in rural integrated care. As a master's student in Marriage and Family Therapy (MFT) at Purdue University, I felt a strong urge to learn more about the role that biological health and wellbeing can play with family systems. This innate desire to learn more about the whole person lead me to pursue a PhD in Medical Family Therapy (MedFT) at East Carolina University (ECU), where traditional couple and family therapy is integrated with the biopsychosocial model (BPS; Engel, 1977, 1981). MedFT and its accompanying tenets became the proverbial "missing puzzle piece" for me; when added to the knowledge I acquired at Purdue. I felt as if I was finally afforded the ability to see families in the holistic, complete way they were meant to be perceived.

My specific interest with children in integrated care did not begin until I started an assistantship as a MedFT at Pamlico Community Health Center, a former pediatric practice turned community health center. The majority of the patients seen at this clinic were children, and most of my formal training in integrated care up to this point focused on adults as patients and their families. As such, I began doing informal research to learn how to help these pediatric patients and the families that came into the clinic with them. While I found some recommended interventions in the literature, many were anecdotal and not empirically supported. Nevertheless, I integrated information that appeared to be relevant to addressing the biopsychosocial issues of children (e.g., Attention Deficit Hyperactivity Disorder, behavioral problems, asthma exacerbated by stress) and used it to develop psychoeducational and brief psychotherapy interventions that could be delivered concurrently with a medical appointment. The struggle to find empirically-supported interventions in the research inspired the first article in this dissertation – a systematic review investigating the availability of brief, integrated interventions addressing BPS issues in pediatric primary care. As a clinician in need, I was disappointed after implementing a rigorous systemic review process to find so little available and relevant research, particularly research that was culturally-appropriate for use with rural under-served populations. Even after submitting this article to a peer-reviewed journal recently, reviewer feedback confirmed the problem: people continue to want to apply interventions developed and studied with majority and/or urban populations with rural under-served populations, assuming without studying relevance. Therefore, this chapter ends with several suggestions for researchers and clinicians begin help move this area of research forward to address these assumptions and deficits.

The second article was inspired by anecdotal evidence and casual conversations with the medical providers and nurses at Pamlico, who would express concerns about excessive utilization from certain children, though these children rarely left the clinic with a diagnosable medical concern (e.g., strep throat, asthma). Often, the staff would passively mention the influence of the child’s parent on these frequent visits, assuming stress or other parenting concerns as the driving force behind these visits. After seeing a pattern myself in a small population of our patients, I began to do my own research on the topic. In the literature, while previous researchers had linked parental BPS concerns to child health care utilization, no studies looked at this specifically in a rural population. Thus, I decided to move forward to learn more about how this relationship presented in the health center in which I was working. The findings did indicate some interesting relationships between parental BPS characteristics and child health care utilization, and as with article one, suggestions are provided in the dissertation for utilizing the results of the second article to inform research and practice. It is my hope that the findings of these studies will lead to more research and changes in policy, affording behavioral health clinicians in rural settings culturally relevant models of care that are respectful of the knowledge and resources available in rural under-served areas. This will then hopefully lead to improvements in integrated care models used by health care teams, and care provided to patients and their families.

REFERENCES

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196*, 129-136.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry*, *137*, 535-544.

CHAPTER ONE: INTRODUCTION

In 2010, the Patient Protection and Affordable Care Act (PPACA), was signed into law (National Council for Community Behavioral Healthcare, 2010), marking the inevitability of health care reform. According to the National Council for Community Behavioral Healthcare (2010), PPACA will lead to major changes to the health care system including: (a) mandating health plans to provide dependent coverage for young adults until the age of 26, (b) prohibiting discrimination for health care plans based on pre-existing medical conditions, and (c) requiring that all individuals maintain health insurance coverage. It will also result in an expansion of Medicaid which will require states to make a number of changes to their Medicaid programs by January 1, 2014, including expanding eligibility levels and streamlining their enrollment processes. Additionally, $50 million in grants have been allocated for coordinated and integrated services through the co-location of primary and specialty care in community-based mental and behavioral health settings (National Council for Community Behavioral Healthcare, 2010). Individuals who work in medically under-served areas and provide pediatric care (e.g., pediatric mental health/behavioral health) for two years are also eligible for a loan repayment program through the PPACA (National Council for Community Behavioral Healthcare, 2010).

The implementation of the PPACA is said to expand insurance coverage to approximately 30 million people, reducing the amount of uninsured people in the US by over half (Buettgens & Hall, 2011). Thus, many of those who could not afford care and were previously forced to choose between health care and basic needs (e.g., food, shelter) will now have access to health care. It has also been estimated that the western and southern regions of the US will experience the greatest impact on insurance coverage (Buettgens & Hall, 2011). According to the Rural Policy Research Institute, in rural regions of North Carolina, health care coverage was expected to increase from 80% prior to the PPACA to 93% after the PPACA (McBride, 2009), a slightly larger increase than in urban areas of North Carolina. Given all of the recent changes, and the increase in insured persons seeking health care, more research is needed to understand the health care needs of these newly covered individuals, particularly in southern rural areas.

Despite an increased need after the implementation of PPACA, health care access has continued to be a challenge in rural areas. Although 21% of the US population resides in rural areas, only 10% of primary care physicians practice in these areas (Bodenheimer & Pham, 2010). In addition to health care access issues, there are unique physical and mental health concerns for families living in rural areas. According to data from the National Survey of Children's Health (United States Department of Health and Human Services, 2007), rural children are more likely to have unintentional injuries, chronic physical or mental health problems, be overweight, and have higher rates of asthma than their urban counterparts (Ernst & Cormier, 2000). Researchers in one study identified that in nearly one quarter of all rural primary care visits, either the parent or physician raised concerns about behavioral, emotional, or developmental concerns as compared to 15-21% in broader samples (Cooper, Valleley, Polaha, Begeny & Evans, 2006). As such, the primary care setting has become a vital part of identifying behavioral and other psychosocial health issues (Kelleher & Stevens, 2009).

To address these mounting psychosocial issues in rural areas and provide a support system for primary care physicians and extenders, there has been a call by researchers for increased integrated care in pediatric primary care clinics (Polaha et al., 2011). The purpose of this chapter is to (a) introduce the benefits of integrated primary care in pediatric settings, (b) articulate the need for family-centered studies to be done prior to developing models for integrating behavioral health services, and (c) provide an overview for all the chapters included in this dissertation highlight the importance for more research to be done in under-served rural pediatric practices.

Integrated Primary Care in Pediatric Health Care Settings

A large need has been identified for integrating psychosocial health care with primary medical care (Blount, 2003; Garfunkel, Pisant, leRoux, et Phil & Stegel, 2011; Miller, Mendenhall, & Malik, 2009; Williams, Burwell, Foy & Foy, 2006). Simply put, integrated primary care “combines medical and behavioral health services to more fully address the spectrum of problems that patients bring to their primary medical care providers” (Blount, n.d., p. 1). Miller et al. (2009), leaders in health care integration, posited that integrated primary care is the most effective way to address the American public’s mental and behavioral health needs. Their recommendation is partly based on the research that “less than one third of patients with diagnosable mental health conditions ever meet with a psychologist or other mental health professional” outside of a medical setting (Gunn & Blount, 2009, p. 236). Additionally, nearly 80% of patients with psychological disorders manage these issues through primary care, (Strosahl, 1997) indicating a need for increased availability of behavioral health services in primary care settings. As one in five children and adolescents in the US experience mental health issues (National Institute for Health Care Management, 2009), pediatricians play an important role in addressing behavioral health issues. Knapp and Foy (2012) reported that:

> Pediatric primary care providers are well positioned to detect children at risk for mental health problems, initiate preventive interventions, and provide early treatment. Integrated mental health care into pediatric primary care settings would involve child psychiatrists

> and other mental health professionals in prevention and expand opportunities for treatment (p. 982).

In one North Carolina based study, researchers found that pediatric residents identified at least one psychosocial concern in nearly 40% of their pediatric patients seen (Williams, Burwell, Foy & Foy, 2006). The consequences for failing to identify and treat psychosocial and behavioral issues in children can be dire and may lead to issues such as distress for children and their families, overutilization of the medical system, non-compliance for medical treatment, and long-term mental health problems (Hill, Lochman, Coie, Greenberg & The Conduct Problems Prevention Research Group, 2004; Riley & Wissow, 2004; Simonian, 2006). The behavioral problems treated in pediatric primary care are associated with psychosocial impairments, physical health issues, and excessive health care utilization (Kolko, Campo, Kelleher, & Cheng, 2010). Integrating behavioral health care with primary care has been identified as an effective way to address these psychosocial issues (Garfunkel, Pisani, leRoux, et Phil, & Siegel, 2011).

A Family-Centered Approach to Pediatric Integrated Care

The biopsychosocial (BPS) model was introduced by Engel (1977, 1980) to provide clinicians with a systemic framework for approaching patient care, as well as an alternative to the more dominant medical model. The BPS model is based on a systems approach (von Bertalanffy, 1968) and acknowledges that humans cannot be reduced or isolated to a single issue or diagnosis (Engel, 1980). Through the BPS lens, humans are considered to be part of a dynamic system, with an understanding that nothing exists in isolation. When providers work through a BPS lens, “social and psychological as well as biological factors” are taken into account to gain a more comprehensive picture of health (Engel, 1977). For providers who work with children, the BPS lens functions as a framework for focusing on the many systemic needs of children. This BPS lens (Engel, 1977, 1980) allows for providers to use a family-centered approach incorporating the family and understanding the socio-emotional context for the problems that arise (Coleman & Howard, 1995).

Theorists and researchers have long posited that children are influenced by their parents, caregivers, and families (Minuchin, Baker, Rosman, Liebman, Milman, & Todd, 1975). For example, family characteristics (e.g., parental psychosocial stress) have been shown in the literature to impact the frequency of child health care utilization (Moran & O'Hara, 2006) (i.e., negative parental affect is linked to increased acute child health care utilization). In fact, children may actually develop concerns needing medical attention as a result of parental psychosocial concerns (Loiselle et al., 2012). The influence of family environment on children has also been identified with medical diagnoses such as asthma; researchers have shown that a stressful environment or experience may trigger issues with asthma, such as episodes that are difficult to control (Bloomberg & Chen, 2005). Family stress has also been associated with lower peak flow rates and increased asthma symptoms (Bloomberg & Chen, 2005). With health care utilization and asthma as two of many examples, a more systemic approach is needed to address biopsychosocial issues in children.

It is well-documented in the literature that children in rural areas experience an increase in health difficulties (Hulme & Blegen, 1999; Vargas, Monajemy, Khurna & Tinaoff, 2002), have a more sedentary lifestyle, (Hortz, Stevens, Holden, & Petosa, 2009) and are being raised by parents and caregivers with high rates of psychosocial problems (Polaha, Dalton, & Allen, 2011); however, little research has been conducted to address these BPS disparities in rural areas. More research must be done to further understand how rural children and their families' health is impacted by BPS issues, and to inspire culturally-relevant clinical innovations using systemic and integrated approaches to sufficiently address them.

Issues in Integrating Traditional Psychotherapy into Pediatric Primary Care

As previously mentioned, there is a considerable need for integrating behavioral health services into pediatric primary care settings (Garfunkel et al., 2011), especially in rural and other under-served areas (Polaha et al., 2011). Cully and colleagues (2012) explained the challenges that behavioral health providers experience in primary care settings, particularly regarding the implementation of traditional, evidence-based therapy treatments. As it is not unusual for patients who present with behavioral health concerns in primary care to also have accompanying physical concerns, brief, less-intensive treatments are often needed that account for physical concerns as well as behavioral health concerns (Cape, Whittington, Buszewicz, Wallace, & Underwood, 2010, Cully et al., 2012; Cully et al., 2010; Nieuwsma et al., 2011). In addition, interventions by behavioral health clinicians must also align with the practice demands of the primary care clinic (e.g., collaboration with primary care providers, time available for interventions) (Cully et al., 2012).

The National Institute for Health Care Management cited several barriers to fulfilling this need, such as lack of mental health providers who are trained to work with children in integrated care settings, and little knowledge of effective, evidence-based treatments for use in integrated pediatric primary care in the literature (2009).When working with children in pediatric primary care, incorporating a systemic and BPS perspective provides an additional layer that behavioral health clinicians must address, as families of the pediatric patients are also impacted by the interventions (National Alliance on Mental Illness, 2011). As such, more research is needed on implementing brief, evidence-based behavioral health interventions that address the BPS needs of children and their families in integrated primary care, as simply taking traditional psychotherapy interventions and implementing them into primary care is insufficient (Cully et al., 2012).

Conclusion

Given health care reform and accompanying pressure for insurance providers to meet minimum coverage standards that include both physical and mental health care (Farley, 2011),the movement toward integrated medical and behavioral health care has already begun. As previously mentioned, there is a large need for integrated primary care models developed for pediatric patients (Garfunkel et al., 2011), particularly in rural areas (Polaha et al., 2011), and more specifically in North Carolina's rural communities (Williams et al., 2006). As such, there is a need for research to be completed to understand more about the biological, psychological, and social needs of children and their families in primary care that may properly prepare behavioral health clinicians to address these issues in a brief, integrated primary care setting.

The subsequent chapters have been written with the intent of providing insight into the needs of children and their families in rural primary health care settings. The second chapter, entitled, "Integrated Pediatric Primary Care: A Systematic Review of Empirically-Reviewed Brief Interventions" is a systematic literature review guided by the following research question: "What brief behavioral health interventions have been studied empirically for use with a pediatric population in an integrated primary care setting?" Outcomes from five research articles that met the inclusion criteria for full review are provided in great detail and provide evidence of the need for research in this area. Most noted was an absence of interventions developed to address problematic family dynamics and their influence on pediatric health, given the literature already establishing this connection (e.g., Bloomberg & Chen, 2005; Moran & O'Hara, 2006).

Also absent were tests on validity for interventions with rural populations. Recommendations for future research are provided at the conclusion of this review. Recommendations include identifying the unique needs of rural pediatric primary care clinics through exploratory research, and creating efficacious and effective family-centered and integrated brief interventions to address these needs.

The third chapter included in this dissertation provides a thorough review of literature covering parental health influences on child health care utilization designed to: 1) analyze research-based literature on the parental influences on child health care utilization and 2) identify the research that has been done on rural populations regarding parental influences on child health care utilization. Although the literature search yielded several studies that confirmed a relationship between parent characteristics such as depression (e.g., Flynn et al., 2004; Minkovitz et al., 2005; Sills et al., 2007), stress (e.g., Raphael et al., 2009) and parental responsiveness (e.g., Holland et al., 2012) on child health care utilization, no researchers examined the influence of parental characteristics on child health care utilization in rural areas. Implementing interventions in rural areas that have been studied predominately in urban settings is not following a culturally responsible approach to research (Stanton et al., 2005), given what is known about the unique characteristics of rural families and children (Polaha, 2011).

The fourth chapter includes a description of the methodology used to construct the quantitative study described in the fifth chapter. The fifth chapter is the second article of the dissertation, and meant to work toward addressing some of the gaps identified through the literature search presented in chapter three. This empirical study was grounded in the fact that although previous researchers have established a relationship between parental characteristics and child health care utilization (Holland et al., 2012; Raphael, Zhang, Liu, & Giardino, 2009), and it has been shown in the research that children and adults in rural areas experience disparities in health care different from their urban or suburban counterparts (Farmer, Clark, Sherman, Marien, & Selva, 2005), no one to date has examined the relationship between parental health and child health care utilization in rural under-served communities. Thus, in order to understand more about the relationship between parental characteristics and child health care utilization specifically in rural areas, the second article is a descriptive cross-sectional research study that examined parents' BPS well-being in relation to pediatric health care utilization. The following research questions guided the study, "Is there a relationship between parent/guardian emotional health characteristics (anxiety, depression, distress, parenting self-efficacy, perceived social support and quality of life) and the frequency of child health care utilization?" and "Is there a relationship between parent/guardian physical health and the frequency of child health care utilization?" A total of 88 parents and guardians participated in the research; Poisson regression modeling was done to investigate the relationship between the parental biopsychosocial variables and child health care utilization. It was identified that parental BPS characteristics, such as physical and mental health quality of life, significantly impacted child health care utilization rates (acute and non-acute) when part of a model incorporating child diagnoses (e.g., asthma, obesity) and demographic characteristics (e.g., parent age). Implications for researchers, clinicians, and policy makers are provided.

The sixth and final chapter is written to discuss the findings from both articles and offer implications for researchers, clinicians, policy makers, and MedFTs, specifically. Included in this chapter are research implications, such as a need for exploratory and interventional research in rural pediatric primary care from a BPS perspective; clinical implications, such as encouraging clinicians to become consumers of systemic research and learn how to apply the knowledge to their patients (e.g., involving parental and family units in screenings and interventions); and policy implications, facilitating reimbursement of BPS integrated care services in pediatric primary care (e.g., opening billable codes for behavioral health clinicians to work with parents and/or different family system members).

REFERENCES

Bloomberg, G. R., & Chen, E. (2005). The relationship of psychologic stress with childhood asthma. *Immunology and Allergy Clinics of North America, 25,* 83-105.

Bodenheimer, T., & Pham, H.H. (2010). Primary care: Current problems and proposed solutions. *Health Affairs, 29,* 799-805.

Buettgens, M., & Hall, M.A. (2011). Who will be uninsured after health insurance reform? Retrieved from http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2011/rwjf69624.

Blount, A. (2003). Integrated primary care: Organizing the evidence. *Families, Systems & Health, 21,* 121-134.

Blount, A. (n.d.). Introduction to integrated primary care. Retrieved from w3w.pcpcc.net/files/CHAP1.DOC

Cape, J., Whittington, C., Buszewicz, M., Wallace, P., & Underwood, L. (2010). Brief psychological therapies for anxiety and depression in primary care: Meta-analysis and meta-regression. *Bio Med Central Medicine, 8,* 38-51.

Cooper, S., Valleley, R.J., Polaha, J., Bejeny, J., & Evans, J.H. (2006). Running out of time: Physician management of behavioral health concerns in rural pediatric primary care. *Pediatrics, 118,* e132-e138.

Coleman, W.L., & Howard, B.J. (1995). Family-focused behavioral pediatrics: Clinical techniques for primary care. *Pediatrics in Review, 16,* 448-455.

Cully, J.A., Armento, M.E.A., Mott, J., Nadorff, M.R., Naik, A.D., Stanley, M.A., Sorocco, K.H., Kunik, M.E., Peterson, N.J., & Kauth, M.R. (2012). Brief cognitive behavioral therapy in primary care: A hybrid type 2 patient-randomized effectiveness-implementation design. *Implementation Science, 7,* 64 – 76.

Cully, J.A., Stanley, M.A., Deswal, A., Hanania, N.A., Phillips, L.L., & Kunik, M.E. (2010). Cognitive-behavioral therapy for chronic cardiopulmonary conditions: Preliminary outcomes from an open trial. *Primary Care Companion Journal of Clinical Psychiatry, 12.* Retrieved from: http://www.ncbi.nlm.nih.gov/pmc/articles/pmc2983462/.

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196,* 129-136.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry, 137,* 535-544.

Ernst, P., & Cormier, Y. (2000). Relative scarcity of asthma and atopy among rural adolescents raised on a farm. *American Journal of Respiratory Critical Care Medicine, 161,* 1563-1566.

Farley, R. (2011). Essential health benefits: What does the new HHS guidance mean for behavioral health? Retrieved from http://mentalhealthcarereform.org/essential-health-benefits-what-does-the-new-hhs-guidance-mean-for-behavioral-health/.

Farmer, J.E., Clark, M.J., Sherman, A., Marien, W.E., & Selva, T.J. (2005). Comprehensive primary care for children with special health care needs in rural areas. *Pediatrics, 116,* 649-656.

Finney, J.W., Lemanek, K.L., Cataldo, M .F., Katz, H.P., & Fuqua, R.W. (1989). Pediatric psychology in primary health care: Brief targeted therapy for recurrent abdominal pain. *Behavioral Therapy, 20,* 283-291.

Flynn, H.A., Davis, M., Marcus, S.M., Cunningham, R., & Blow, F.C. (2004). Rates of maternal depression in pediatric emergency department and relationship to child service utilization. *General Hospital Psychiatry, 26,* 316-322.

Garfunkel, L.C., Pisani, A.R., leRoux, P., et Phil, D., & Siegel, D.M. (2011). Educating residents in behavioral health care and collaboration: Comparison of conventional and integrated training models. *Academic Medicine, 86,* 174-179.

Gunn, W.B., & Blount, A. (2009). Primary care mental health: A new frontier for psychology. *Journal of Clinical Psychology, 65,* 235-252.

Hill, L.G., Lochman, J.E., Coie, J.D., Greenberg, M.T., & The Conduct Problems Prevention Research Group. (2004). Effectiveness of early screening for externalizing problems: Issues of screening accuracy and utility. *Journal of Consulting and Clinical Psychology, 72,* 809-820.

Holland, M.L., Yoo, B.K., Kitzman, H., Chaudron, L., Szilagyi, P.G., Temkin-Greener, H. (2012). Mother-child interactions and the associations with child healthcare utilization in low-income urban families. *Maternal and Child Health Journal, 16,* 83-91.

Hortz, B., Stevens, E., Holden, B., & Petosa, R. L. (2009). Rates of physical activity among Appalachian adolescents in Ohio. *The Journal of Rural Health, 25,* 58-61.

Hulme, P. A., & Belgen, M. A. (1999). Residential status and birth outcomes: Is rural/urban distinction adequate? *Public Health Nursing, 16,* 176–181.

Kelleher, K.J., & Stevens, J. (2009). Evolution of child mental health services in primary care. *American Academy of Pediatrics, 2009*, 7-14.

Kolko, D.J., Campo, J.V., Kelleher, K., & Cheng, Y. (2010). Improving access to care and clinical outcome for pediatric behavioral problems: A randomized trial of a nurse-administered intervention in primary care. *Journal of Developmental and Behavioral Pediatrics, 31,* 393-404.

Knapp, P. K., & Foy, J. M. (2012). Integrating mental health care into pediatric primary care settings. *Journal of the American Academy of Child & Adolescent Psychiatry, 51,* 982-984.

Loiselle, K.A., Lee, J.L., Gilleland, J., Campbell, R., Simpson, P., Johnson, G., Dooley, K., & Blount, R.L. (2012). Factors associated with healthcare utilization among children with noncardiac chest pain and innocent heart murmurs. *Journal of Pediatric Psychology, 37,* 817-825.

McBride, T.D. (2009). Impact of the patient protection and affordable care act on covered persons as amended. Retrieved from: http://www.rupri.org/Forms/McBride_Insurance_Amended_Dec09.pdf

Miller, B.F., Mendenhall, T.J., & Malik, A.D. (2009). Integrated primary care: An inclusive three-world view through process metrics and empirical discrimination. *Journal of Clinical Psychology in Medical settings, 16,* 21-30.

Minkovitz, C.S., Strobino, D., Scharfstein, D., Hou, W., Miller, T., Mistry, K.B., & Swartz, K. (2005). Maternal depressive symptoms and children’s receipt of health care in the first 3 years of life. *Pediatrics, 115,* 306-314.

Minuchin, S. Baker, L., Rosman, B.L., Liebman, R., Milman,L., & Todd, T.C. (1975). A conceptual model of psychosomatic illness in children: Family organization and family therapy. *Archives of General Psychiatry, 32*, 1031-1038.

Moran, T.E., & O'Hara, M.W., (2006). Maternal psychosocial predictors of pediatric health care use: Use of the common sense model of health and illness behaviors to extend beyond the usual suspects. *Clinical Effectiveness in Nursing, 952*, 171-180.

National Alliance on Mental Illness (2011). A family guide: Integrating mental health and pediatric primary care. Retrieved from: http://www.nami.org/Content/ContentGroups/CAAC/FG-Integrating.pdf

National Council for Community Behavioral Healthcare (2010). Summary of the major provisions in the the patient protection and affordable health care act. Retrieved from: http://www.thenationalcouncil.org/galleries/policy-file/HCR%20Summary%20Chart%20Updated%20with%20Approps%20Info%2010-22-10.pdf

National Institute for Health Care Management (2009). Strategies to support the integration of mental health into pediatric primary care. Retrieved from: http://nihcm.org/pdf/PediatricMH-FINAL.pdf

Nieuwsma, J.A., Trivedi, R.B., McDuffie, J., Kronish, I., Benjamin, D., & Williams, J.W. (2011). *Brief psychotherapy for depression in primary care: A systematic review of the evidence (VA-ESP Project #09-010).* Washington, DC: Department of Veterans Affairs, Veterans Health Administration.

Polaha, J., Dalton, W.T., & Allen, S. (2011). The prevalence of emotional and behavioral problems in pediatric primary care serving rural children. *Journal of Pediatric Psychology, 36,* 652-660.

Raphael, J.L., Zhang, Y., Liu, H., & Giardino, A.P. (2009). Parenting stress in US families: Implications for pediatric healthcare utilization. *Child: Care, Health and Development, 36,* 216-224.

Riley, A. W., & Wissow, L. S. (1994). Recognition of emotional and behavioral problems and family violence in pediatric primary care. In J. Miranda, A. A. Hohmann, C. C. Attkisson, & D. B. Larson (Eds.), Mental disorders in primary care (pp. 206-238). San Francisco: Jossey Bass.

Sills, M.R., Shetterly, X., Xu, S., Magid, D., & Kempe, A., (2007). Association between parental depression and children's health care use. *Pediatrics, 119,* e829-e836.

Simonian, S. J. (2006). Screening and identification in pediatric primary care. *Behavioral Modification, 30,* 114-130.

Stanton, B., Guo, J., Cottrell, L., Galbraith, J., Li, X., Gibson, C., Pack, R., Cole, M., Marshall, S., & Harris, C. (2005). The complex business of adapting effective interventions to new populations: An urban to rural transfer. *Journal of Adolescent Health, 37,* 163e17-163e26.

Strosahl, K., Baker, N. J., Braddick, M., Stuart, M. E., & Handley, M.R. (1997). Integration of behavioral health and primary care services: The group health cooperative model. In N. A. Cummings, J. L. Cummings, & J. N. Johnson (Eds.), Behavioral health in primary care: A guide for clinical integration (pp. 61–86). Madison: Psychosocial Press.

United States Department of Health and Human Services. (2005). *National survey of children's health*. Retrieved from: http://www.cdc.gov/nchs/slaits/nsch.htm

Vargas, C. M., Monajemy, N., Khurana, P., &Tinanoff, N. (2002). Oral health status of children attending Head Start Maryland 2000. *Pediatric Dentistry*, *24*, 257–263.

Von Bertalanffy, L. (1968). *General Systems Theory*. New York: Braziller.

Williams, J., Burwell, S., Foy, C.G., & Foy, J.M. (2006). Addressing behavioral health issues during well child visits by pediatric residents. *Clinical Pediatrics, 45,* 734-740.

Wright, L.M., Watson, W.L., & Bell, J.M. (1996). *Beliefs: The heart of healing in families and illness.* Basic Books: New York.

CHAPTER 2: INTEGRATED PEDIATRIC PRIMARY CARE: A SYSTEMATIC REVIEW OF EMPIRICALLY-REVIEWED BRIEF INTERVENTIONS

It is estimated that about half of all pediatric office visits involve concerns related to behavioral, psychosocial, or educational issues (Connor et al., 2006). Psychosocial problems "are the most common chronic conditions for pediatric visits, eclipsing asthma and heart disease" (Kelleher, McInerny, Gardner, Childs, & Wasserman, 2000, p. 1320). Researchers indicated that psychosocial issues are even more of a concern among rural pediatric populations (Polaha, Dalton & Allen, 2011). Polaha et al. hypothesized that there might be increased prevalence of psychosocial issues in rural pediatric primary care for two reasons (2011). First, a relationship has been identified between psychosocial functioning and increased health care utilization. Parents turn to primary care for help with psychosocial issues (Polaha et al., 2011) as there is generally less access to mental health services in rural areas (Campbell, Kearns, & Patchin, 2006). This limited access to mental health care makes the rural pediatric primary care clinic setting a critical venue for identifying and managing mental health issues, including behavior problems (Kolko, Campo, Kelleher, & Cheng, 2010).

Second, "the frequent use of primary care among families with children who have psychosocial problems may be a function of significant health disparities in rural areas" (Polaha et al., 2011, p. 656). Greater mental health concerns often coincide with chronic illness in children (as in adults), and thus associated with increased primary health care utilization among children (Bilfield, Wildman & Karazsia, 2006; Polaha et al., 2011). These unaddressed psychosocial issues can lead to a "tremendous financial and human burden" (Adams & Kagnoff, 1983, p. 5).

Integrating behavioral health interventions into adult primary care practice has been shown in the literature to be successful for a variety of psychosocial issues, from anxiety (e.g., Price, Beck, Nimmer & Benson, 2000) and depression (e.g., Robinson, 1998) to substance abuse (e.g., Oliansky, Wildenhaus, Manlove, Arnold, & Schoener, 1997). Garfunkel and colleagues suggested that children also benefit when physical health clinicians and behavioral health clinicians collaborate (Garfunkel, Pisani, leRoux, et Phil, & Siegel, 2011). Additionally, pediatric patients and families in rural areas are more likely to follow through with behavioral health referrals from their primary care provider when mental health care is integrated into the practice (Valleley et al., 2007).

Behavioral Health and Pediatric Primary Care

Researchers suggested that anywhere from 10-20% of children and adolescents in the general population experience significant mental health and/or psychosocial disorders (Connor et al., 2006; Jellinek et al., 1999), a number that appears to be growing in the United States. In rural pediatric populations, this number is said to be as high as 21% (Polaha et al., 2011). In one study of a rural primary care clinic, 33% of all pediatric visits (ages four and up) generated a psychosocial concern from either the parent or provider (Cooper, Valleley, Polaha, Bejeny, & Evans, 2006). Many times, these psychosocial issues are overlooked or unaddressed by medical providers (Brown, Riley, &Wissow, 2007), for reasons such as inadequate training, feelings of unease, minimal tools to address the issues, lack of time necessary to discuss psychosocial problems, and limited access to mental health specialists (Kolko et al., 2010; Pidano, 2011). Overall, patients in rural areas are especially likely to experience poorer access to mental health care and a shortage of mental health professionals (Polaha et al., 2011).

Issues that arise in pediatric primary care clinics and may require integrated behavioral health services can include more commonly observed psychiatric issues (e.g., depression and anxiety) and behavioral issues (e.g., acting out) (Arndorfer, Allen & Aljazireh, 1999; Meadows,Valleley, Haack, Thorson, & Evans, 2011). However, issues that are generally categorized as biomedical concerns (e.g., obesity, chronic headaches, asthma) can also be positively influenced by behavioral health professionals (Allen, Elliot & Arndorfer, 2002; Celano, 2006; Poston, et al., 2006). Arndorfer and colleagues (1999) suggested that due to the biopsychosocial composition of patients' presenting concerns, many of the concerns seen in primary care necessitate both physical and behavioral treatments.

In order to meet the biological and behavioral needs of patients in primary care, several models of collaborative behavioral health care have been created over the past two decades (Blount, 2003; Blount, et al., 2007). There are many different terms that are used interchangeably to describe collaborative behavioral health care, such as "collaborative, coordinated, co-located, care management, and integrated care" (Hunter, Goodie, Oordt & Dobmeyer, 2010, p. 3). According to Blount (2003; Blount et al., 2007), the collaboration of behavioral health services in primary care falls on a continuum. At one end of the continuum is *coordinated care,* where primary care providers and behavioral health providers work in separate settings, and provide different care. For example, if there is a referral from a primary care provider to a mental health clinic, information is generally exchanged between the two facilities for the purpose of the referral and is shared on an as-needed basis (Blount, 2003). The next level is *co-located care,* in which both the primary care and behavioral health provider are located in the same building or office, though different services are provided (Blount, 2003). In co-located care, there is generally a process for referring patients in need of behavioral health services who begin services as medical patients (Blount, 2003). Finally, *integrated care* is at the other end of the continuum (from coordinated care), whereby both primary care and behavioral health providers work together in a shared system to create a single treatment plan with a shared medical record (Blount, 2003; Hunter, 2010). This article will focus on the collaborative behavioral health care at the integrated care level.

Doherty, McDaniel, and Baird introduced the idea of multiple levels of collaboration in the integration of behavioral health and primary care with the "Levels of Systemic Collaboration Model" (1996, p. 25). This five-level hierarchy is explained as,

> …the degree of involvement and sophistication in collaborative health care involving mental health professionals and other health professionals…the levels refer both to the extent to which collaboration occurs and the capacity for collaboration in a health care setting as a whole." (Doherty et al., 1996, p. 25).

The first level of collaboration is *Minimal Collaboration*, in which health care and mental health professionals work in separate locations, have separate systems, and rarely discuss cases; this is reflective of most agencies and private practice settings. Level two is *Basic Collaboration at a Distance*, where providers periodically converse about specific patient issues, though this is infrequently done face to face. The providers in level two have separate facilities and systems, and are generally linked through referrals between the systems.

Level three is termed *Basic Collaboration On-Site*. Facilities are shared yet providers have separate documentation systems. Communication regarding shared patients is regular and is occasionally done in person. Doherty et al. (1996) explained, "They appreciate the importance of each other's roles, may have a sense of being part of a larger, though somewhat ill-defined team, but do not share a common language or an in-depth understanding of each other's worlds"

(p. 26). In the first three levels, the medical providers (e.g., physicians) generally have more influence over the final decisions on managing patients.

At level four: *Close Collaboration in a Partly Integrated System*, providers are located in the same facility and may have certain systems shared, such as scheduling. Both medical and behavioral health providers meet to discuss patients face-to-face and coordinate treatment plans regularly. Level four providers have a "shared allegiance to a biopsychosocial/systems paradigm" (Doherty et al., 1996, p. 27). At this level, it is likely that medical providers still maintain greater power over the team than behavioral health providers.

At the end of the continuum is level five: *Close Collaboration in a Fully Integrated System*. At this level, mental health and medical care providers share the same facility, systems, and vision, "in a seamless web of biopsychosocial services" (Doherty et al., 1996, p. 28). The providers regularly meet to discuss issues related to patients and the collaborative team. Members of the team make great efforts to balance the influence and power among professionals.

Notably, there has been a call for researchers to study interventions targeting children's psychosocial needs in the context of primary care (Kolko et al., 2010) that are integrated (Valleley et al., 2007), evidence-based (Kolko et al., 2010) brief, and family-centered in nature (Coleman & Howard, 1995). Coleman and Howard (1995) explained the purpose of a family-centered approach, "When a problem seems resistant to the initial child-centered assessment and interventions, care providers should incorporate the family context approach; understand the social-emotional context in which the problem occurs and form a partnership with the family to resolve the problem" (p. 260). For example, when working with pediatric asthma, incorporating the patient's parents and family members can strengthen the outcomes of treatment in primary care (Celano, 2006). This systemic perspective is supported by the biopsychosocial model (BPS; Engel, 1977, 1980), which is used to endorse the inclusion of social systems in the study and treatment of biological and psychological concerns. However, it is unclear how often all three dimensions [biological, psychological, and social] are incorporated into interventions designed to address behavioral and physical health concerns in pediatric primary care practices.

In this review, the authors aimed to: 1) conduct a systematic review of the outcome-based empirical literature on brief behavioral health (BBH) interventions used with pediatric populations in integrated primary care settings, 2) compare and contrast BBH interventions used, demographics of populations served, and outcomes reported in studies done with pediatric primary care populations, 3) identify the empirical literature where children with or without their family members were targeted for BBH intervention in collaborative/integrated primary care practices, and 4) highlight the gaps in the existing studies and note areas where future research is needed. The primary research question guiding this systematic review was, “What brief behavioral health interventions have been studied empirically for use with a pediatric population in an integrated primary care setting?”

Method

A seven-step model for research synthesis (Cooper, 2010) was utilized during this systematic review of the literature. The first step of research synthesis was *Formulating the Problem*, which as mentioned previously, was to identify the brief behavioral health interventions that have been empirically studied for use with the pediatric population in an integrated primary care setting. The second step, *Searching the Literature,* was completed using the following databases: PsycINFO via EBSCO, Medline via PubMed, Academic Search Complete via EBSCO, and the Biomedical Reference Collection: Comprehensive. The search terms used for this review, are outlined in Table 1. In steps three, G*athering Information from Studies*, and four, *Evaluating the Quality of Studies*, (Cooper, 2010), articles considered for selection were based on a review of the information presented in the title and/or the abstract. Articles were categorized as “possibly include” or “exclude.” The articles that were categorized as “possibly include” were read further to determine if they met all inclusion criteria. If so, they were included, and any duplicate articles were excluded. Next, the reference lists of the articles gathered from the database search were viewed for additional significant studies that may meet the inclusion criteria. The inclusion criteria were:

- Interventions must take place in the context of a pediatric primary care setting and that setting must be at least co-located with a behavioral health and a primary care provider on site. For the purposes of this review, anyone with training in behavioral health issues and a degree in a related field was acceptable (e.g., nurses with specified training; a master’s degree or higher in a mental health field such as marriage and family therapy, social work, or psychology was preferred but optional),
- Interventions must include the pediatric patient (the inclusion of parent, family members, or a caregiver was optional),
- Interventions must target pediatric-focused behavioral, psychosocial, or biomedical issues,
- Interventions must be brief (30 minutes or less) and were not limited by number of follow up sessions.
- Articles must be in a peer-reviewed English-language journal, and
- Articles must include original empirical research (qualitative or quantitative).

After excluding duplicate articles, 3,674 journal articles were found using the database search strategy (Cooper, 2010). The titles and abstracts were reviewed resulting in a total of 124 articles for full text review. A total of five publications fit the criteria to be included in the review, with no additional pertinent articles found after searching the reference lists of these five articles. To help increase the rigor of the search process, two research assistants also searched for and reviewed the articles. In the event of a disagreement, all three researchers met face to face and deliberated until a consensus was reached. In all cases of disagreement, the researchers were successful in reaching consensus after meeting in person.

In step four, the "Study Design and Implementation Assessment Device" (Study DIAD) was used to evaluate the quality of the articles (Valentine & Cooper, 2008, p. 130). After the studies were selected, step five, *Analyzing and Integrating the Outcomes of Studies*, was completed (Cooper, 2010). Thematic categories were established by the first author, and agreed upon by the second author, for presenting the research reviewed. A table was created to compare the content of selected articles (see Table 2) and another to compare selected articles on overall quality per the Study DIAD (see Table 3; Cooper, 2010; Valentine & Cooper, 2008). Step six involved *Interpreting the Evidence,* which will be discussed further in this review, as a means of fulfilling step seven, *Presenting the Results* (Cooper, 2010).

Results

The results for this review have been organized into three categories: interventions targeted toward biomedical problems (e.g., headache), interventions targeted toward behavioral problems (e.g., child acting out), and interventions targeting both biomedical and behavioral issues. Of the five articles that fit the criteria for inclusion, two were focused on biomedical issues, one on behavioral issues, and two incorporated both biomedical and behavioral issues into the intervention. Please reference Table 2 for a summary of the articles.

Biomedical Interventions

One of the two biomedically-based intervention articles focused on pediatric headaches (Allen, Elliot & Arndorfer, 2002) and the other on pediatric abdominal pain (Finney, Lemanek, Cataldo, Katz, & Fuqua, 1989). Allen and colleagues created a behavioral management treatment package for children suffering from frequent headaches. Treatment took place in the standard exam rooms of a busy primary-care pediatric clinic (serving over 100 patients per day) of a large Midwestern university. Children participated in five brief (10-15 minute) sessions of thermal biofeedback training executed by trained master's level behavioral health clinicians. Participants were encouraged to continue the practice at home daily.

The protocol for the behavioral interventionists included scripts for how to introduce treatment, how to explain biofeedback, and how to teach hand warming using imagery, as well as forms for monitoring pain and biofeedback and specific guidelines for how parents should participate in treatment. Six of the seven children demonstrated significant reductions in one or more headache parameters (frequency, duration, or intensity) after treatment. Allen et al. (2002) explained the effectiveness of the intervention: "Perhaps most important is that these results were obtained in a typically busy, noisy pediatric primary-care setting, implemented by a master's-level clinician with no special expertise in biofeedback or pain management" (p. 185). The researchers did not explicitly describe how fidelity was maintained in the execution of the intervention, though did explain that the clinician used scripts from the published protocol for the biofeedback treatment (Allen & Mathews, 1998).

The level of integration in this study seemed to be a level three: *Basic Collaboration on Site* (Doherty et al., 1996); the authors explained that the therapist had a master's degree in clinical psychology and provided behavioral health services in the primary-care clinic. However, it was unclear if the providers and the behavioral health clinician worked together closely and consulted on the cases frequently, as it was only stated that the results of the treatment were reviewed with the referring physician at the conclusion of treatment.

In this study, there was a small sample size (n=7), making it difficult to generalize the results to the general population. Although the results were clinically significant, the sample size was not large enough for sufficient power to determine effectiveness. There was no comparison group in this study, which should be a key component to any follow-up studies investigating the same (or a similar) intervention. Additionally, there was limited information on the demographics of the participants (e.g., household income, number of parents in the household, number of siblings, ethnicity), and whether or not the study took place in a rural, suburban, or urban area, also influencing generalizability. Methodologically, the authors discussed parental involvement, though it was measured by anecdotal evidence only; self-report by the parents was used as a way of measuring if the parents complied with the guidelines to allow the patient to manage their pain independently. Also, the researchers did not explore the systemic impact of the intervention,(e.g., as children's headaches decreased, did parents notice any changes in their child's or their own health/stress level, or, What other areas of the child's life were there notable changes [e.g., school, family functioning, etc.]?) Despite these critiques, this article did provide insight into the effectiveness of brief biofeedback training on pediatric headache.

In the second biomedically-focused article, Finney et al. (1989) implemented a protocol directed toward decreasing pediatric abdominal pain. The authors incorporated at least one of five interventions with each participants (a) self-monitoring (encouraging parents to allow their children to take responsibility for recording their own pain); (b) limited reinforcement of illness behavior (parents were asked to limit their discussions of pain with their children to one or two short conversations daily); (c) relaxation training (parents were provided relaxation tapes of progressive muscle relaxation and diaphragmatic breathing to use daily with their children); (d) dietary fiber supplements (a dietary supplement of 5 to 10 grams of fiber was prescribed to the children with bowel irregularity or constipation); and/or (e) participation in routine activities (school attendance was required on all days, with the exception of acute symptoms such as vomiting, fever, or diarrhea).

This study took place in suburban Columbia, Maryland, and targeted children with chronic abdominal pain and their parents who belonged to a health maintenance organization (HMO). Pain symptom ratings (completed by parents), pain outcome ratings, school attendance and school nurse visits, and health care utilization data were gathered for each participant. Data on health care utilization for 16 untreated children in the same HMO were collected as a comparison group.

At the follow-up phone contact, 81% of parents rated their children's pain symptoms as improved or resolved after treatment, while 19% of parents rated pain symptoms as unchanged or worsened. School absences were also found to decrease after treatment (from 8.8% of missed school days, to 3.5%; average school absence for the district was 7.1%, leaving treated children well below the average).

In this article, the authors did not operationalize the decision making process for which participants received what treatments, making replication of the study and implementation of the protocol difficult. Because of the structure of the study, it was unclear which parts of the interventions were most useful, as different combinations were used with each participant. Future studies may benefit from isolating the individual interventions in order to compare them against one another. The researchers did not discuss how fidelity in executing interventions was measured.

The level of integration followed was unclear, though the pediatric psychology service was based in the primary care setting, meeting the requirements for level three: *Basic Collaboration on Site* (Doherty et al., 1996). The amount of collaboration between the psychologist and the primary care providers was unclear, a variable that might influence how the treatment is delivered (for example, as a unified treatment team with the medical provider and the behavioral health provider versus varied messages from the different providers). Similar to the critiques for the previous article, there was no attention given to the role of family dynamics or parental issues (e.g., well-being, stress) in response to the intervention or presenting concerns. This study took place in suburban Columbia, MD, limiting the generalizability of the findings. Finally, the authors discussed the decrease in school absences in the intervention group, though there is concern of possible confounding variables, such as the parents being held more accountable to making their children go to school (as they have someone to report back to).

Behavioral Interventions

The behavioral intervention article (Minkovitz et al., 2003) explored interventions targeting behavioral issues in primary care settings. The Healthy Steps for Young Children Program (Minkovitz et al., 2003) included a variety of behavioral health aspects, such as providing support and information to parents about parenting and child development. The program included seven different services that were provided to the families in the intervention group (though not all families utilized all services). The services included:

- Enhanced well-child care (through visits with the physician and Healthy Steps Specialist). In these brief visits, parents' questions and concerns about child development and behavior were addressed, using "teachable moments" and promotion of these positive parent-child interactions,
- Visits emphasizing mother's health and encouraged early learning through the Reach Out and Read program (Zuckerman, Kaplan-Sanoff, Parker, & Young, 1997),
- Six home visits in the first three years by a Healthy Steps Specialist,
- A Healthy Steps Specialist-staffed a child development telephone line,
- Developmental assessments,
- Written materials emphasizing prevention and health promotion; parent groups offering support and learning opportunities, and/or
- Targeted referrals to community resources.

This was a three year, prospective controlled trial with 15 urban pediatric practice sites in 14 states across the United States. Newborns were enrolled at birth/first office visit and followed until the age of three (n=5,565). At each site, newborns were put into either Healthy Steps intervention or usual care groups; the usual care group received standard pediatric care at the practice, and the Healthy Steps group received usual care and access to the Healthy Steps services. Both groups were cared for by the same Healthy Steps clinicians at their respective sites. Participants in the intervention group were offered all components of the program and were assigned a Healthy Steps Specialist (i.e., nurses, nurse practitioners, early childhood educators, and social workers with training and experience in child development). It was unclear how it was decided which families received which components of the program, though "more than 75% of intervention families received 4 or more Healthy Steps-related services, had a home visit, discussed more than 6 topics, had developmental assessments, and received books" (Minkovitz et al., 2003, p. 3086). Each site was assigned two Healthy Steps Specialists for the duration of the program.

A total of 3,737 (67.2%) of the families participated in the follow-up interview at 30 to 33 months (1,716 usual care families; 2,021 Healthy Steps families). The mothers who responded to the follow-up interview had more formal education, were older, white, non-Hispanic, married, employed, and did not receive Medicaid. Overall, greater percentages of intervention than usual care families reported an "increased use of favorable discipline techniques" such as reduced likelihood of slapping their child in the face or spanking and were also more likely to practice negotiating and ignoring. For mothers with depressive symptoms, a greater number of intervention mothers than control mothers reported sadness to someone in the practice, at about two times greater rate. Please see Table 2 for specific statistics.

The intervention group appeared to be at a level four: *Close Collaboration in a Partly Integrated System* (Doherty et al., 1996). Healthy Steps Specialists and physicians completed joint visits, and had regular team meetings. "Key site personnel" were trained in "child development, parenting, and practical clinical strategies; emphasizing the importance of relationships; promoting multidisciplinary team building; and helping practices implement Healthy Steps" (Minkovitz et al., 2003, p.3083).

While the researchers studied brief psychosocial interventions in the pediatric primary care clinic, there were other variables studied in the intervention group with the psychosocial intervention exclusively (e.g., the telephone line staffed by the Healthy Steps Specialist to discuss any child developmental concerns). The lack of isolation between the interventions makes it difficult to identify which part of the intervention influenced the change. Additionally, in order to re-create the interventions from the Healthy Steps Specialist in a primary care setting, more in-depth information about the actual protocol and steps taken by the specialists would be necessary. There was also much variability in the educational background of the Healthy Steps Specialists. The authors did not specify the length or extent of training, which could have impacted the quality and content of the interventions from specialist to specialist. Beyond monitoring implementation of written protocol by the Healthy Steps national office, no fidelity checks were discussed in the article for the interventions.

Biomedical and Behavioral Interventions

Turner and Sanders (2006) and Walker and colleagues (2002) explored interventions that were directed toward both biomedical and behavioral issues. Turner and Sanders (2006) studied the effectiveness of the Primary Care Triple P (Sanders, Turner, & Markie-Dadds, 2002), a preventative behavioral family intervention program, within typical clinic work settings and normal restrictions, for parents requesting help for child behavior problems. There were four primary parts to the Primary Care Triple P program (a) three or four brief (30-minute) individual family consultations, following protocol outlined by Turner et al., (1999); (b) both parents were encouraged to attend sessions with a child health nurse, though with the exception of one family, only the mothers participated; (c) advice on managing problem behaviors was provided to parents, by using selective use of parenting tip sheets and video resources covering common developmental and behavioral problems, and; (d) parents were provided with resources such as positive parenting principles booklet, 26 tips for parenting on common behaviors with toddlers and preschoolers, and general parenting issues. Three videotapes on parenting solutions were also provided to the parents.

Participants were children and their parents presenting to one of three community child health clinics, requesting advice about behavioral problems or development issues in the children. They resided in the low-income areas of Brisbane, Australia. Their children had not received prior diagnoses of developmental delay, developmental disorder (e.g., autism), conduct disorder or ADHD; the children were not currently taking medication or in regular contact with another professional for behavioral problems, nor were the parents. Parents were able to read English. There were a total of 30 families participating in this research, 25 of whom completed post-intervention assessment (83%). Families were predominately two parent families (80%), with working fathers (92%) and mothers in part time (55%) or full time (10%) employment.

Randomized repeated-measures design was used with a group comparison methodology; families were randomly assigned to either the Brief Primary Care Triple P intervention or wait-list. Families were assessed for child behavior, parenting behavior, parent-child interaction, and parent confidence and adjustment, pre-and post-intervention, and intervention families were also assessed at a six month follow-up. Measures were completed by the primary caregiver (which was the mother in all but one family). Parents who received the Primary Care Triple P intervention reported significantly lower rates of the target problem child behaviors, significantly lower reliance on dysfunctional parenting practices (e.g., spanking) and greater level of satisfaction in their parenting role than mothers in the wait-list control.

There was great potential in this article to investigate the systemic impact of the intervention and to explore what other child-level outcomes were found. For example, did this intervention impact the child in any other realms, such as school performance (as reported by parents/teachers)? Additionally, what biomedical issues were influenced by the intervention (i.e., did this reduce health care utilization)? Although this was an integrated care intervention in that systemic psychosocial issues were addressed in a pediatric primary care setting, it was nurses, rather than specifically-trained behavioral health providers, delivering the mental health services. Also, the authors did not specify the role that medical providers played in the intervention, nor how the team of Triple P nurses and medical providers collaborated during the intervention. Thus, if the nurses are considered to be the behavioral health providers in this situation, given the information provided in the article, this might be considered a Level One: Minimal Collaboration. Although the providers were co-located (Blount, 2003), there did not seem to be any collaboration between the behavioral health providers (the nurses, in this instance) and the general practitioners.

Regarding fidelity, the nurses who implemented the intervention completed checklists in order to document the content discussed in each consultation, along with the length of the session and the materials used (Turner & Sanders, 2006). An analysis of the checklists showed 100% (self-reported) compliance to the protocol.

The second article targeting both biomedical and behavioral issues focused on promoting adolescent health in the primary care setting (Walker et al., 2002). The researchers investigated mental and physical health, and stages of change regarding four health behaviors (diet, exercise, smoking, and drinking alcohol). The participants, British teenagers, signed up to be involved in one 20 minute consultation with a general practice nurse to discuss health and health related behaviors. Nurses received training in the study protocol of improving adolescent health self-efficacy.

The adolescent participants in Hertfordshire, UK, a county north of London, were randomized into either the control group (n=504) or the intervention group (n=466). The control group received usual care and participants in the control group were sent baseline questionnaires to answer at home. Both groups completed follow up questionnaires at three and 12 months and were invited to come in at 12 months to give a saliva sample. More than one third of the participants were offered follow up care, either to the general practitioner for health problems, to the nurse for health-related behavior, or to mental health; it was unclear if the services for mental health were provided at the same clinic, or if the participants were referred out.

At the three month follow-up, more participants in the intervention group than in the control group reported positive change in at least one of the four areas of health related behavior and on the stages of change for at least one of the four key behaviors, with no significant difference at the twelve month follow up.

As with the previous article, the authors did not specify the role that medical providers played in the intervention, if any, nor was it discussed how the intervention nurses and medical providers collaborated during the intervention. Thus, if the nurses are considered to be the behavioral health providers in this situation, this would be at a Level One: Minimal Collaboration; the only collaboration discussed in the article was the referral between the medical providers and the behavioral health providers (the nurses) (Doherty et al., 1996). The intervention was, however, co-located (Blount, 2003). The nurses received training in the study protocol, though no explicit fidelity check was described in the article. It was stated that the nurses were observed by the researchers twice to be see how the study protocol training “was interpreted in practice” (Walker et al., 2002, p. 2), although nothing more was stated regarding whether or not the nurses did adhere to the protocol.

It seems as if the intervention might have been stronger if the initial consultation with the nurse was followed up with a second consultation. Additionally, there was a certain amount of ambiguity in the reporting of what exactly was discussed with the nurse beyond the questionnaires, and little information about whether or not the participants followed up with the providers they were referred to (e.g., primary care provider, mental health). Also, if some participants did follow-up with other providers, while others did not, this might have influenced the outcome data. The authors did not state if seeking other care (e.g., mental health) throughout the duration of the study was part of the exclusion criteria, as this might have influenced the outcomes for the group. Beyond parental consent, there was no involvement of the parents or the family of the participants, an element that might be included in a similar future study.

Discussion

All brief behavioral health interventions explored in this systematic review showed promise for use in pediatric primary care settings by behavioral health professionals, though methodological rigor varied from study to study (please see Table 3 for more information). Sample sizes ranged from 7 to 5,565, leaving a lot of variability for the generalizability of the studies. Additionally, only two research teams outlined their sample characteristics clearly (Minkovitz et al., 2003; Turner & Sanders, 2006) though all of the interventions were focused on children and/or adolescents. Among the remaining three, there was limited information about participant demographics. Overall, the size of the community (rural vs. suburban vs. urban) and practice size went unmentioned in the articles. Three of the five articles incorporated a family/systemic component to the intervention (Finney et al., 1989; Minkovitz et al., 2003; Turner & Sanders, 2006). One study (Allen et al., 2002) incorporated limited family involvement, and the final intervention focused on the child-participant solely (Walker et al., 2002).

Implications for Research and Practice

There is a strong need for empirical studies to be done on *brief* interventions for children and their families in the integrated, rural pediatric primary care setting. Although there were many publications providing suggestions for integrating behavioral and medical care with children (e.g., Erickson, Gerstle, & Feldstein, 2005; Kolko et al., 2010) few were empirically based (e.g., Connor et al., 2006; Husky, Miller, McGuire, Flynn, & Olfson, 2010), and few were empirically based *and* brief in nature (e.g., Finney et al., 1989; Turner & Sanders, 2006). As evidenced in this review, there is a need for studies focusing on behavioral health interventions in pediatric primary care that include a systemic component, as only a small amount of researchers have studied the relationship between integrated care and its impact on children's biomedical and psychosocial health (Celano, 2006; Finney, Riley & Cataldo, 1991; Kramer & Garralda, 2000) and parenting practices and parental satisfaction (Minkovitz et al., 2003).

The authors propose that several layers of future research need to be addressed in the area of rural integrated pediatric primary care. First, exploratory research must be done to understand more about the many systems that influence pediatric primary care. Gaining an understanding of how the different systems interact (i.e., parent subsystem, child subsystem, and health care system) might provide great insight into what needs are not being met and what interventions are necessary in the rural pediatric primary care setting to sustain better child and family health practices. At this level, correlational research might be useful in determining factors (and other systems) that contribute to child health and well-being in rural areas. A sample research question incorporating multiple systemic issues might be, "Does parent/caretaker psychosocial health influence child health care utilization in rural populations, regardless of child complaint?" Additionally, employing a qualitative-focused, citizen health care model (Doherty & Mendenhall, 2006) involving patients, families, and the community would be helpful at this step in establishing the needs in rural pediatric primary care clinics. Only recently have researchers revealed that rural children experience additional health issues and disparities as compared to their non-rural counterparts (Polaha et al., 2011). For example, children in rural areas are more likely to have a sedentary lifestyle (Hortz, Stevens, Holden, & Petosa, 2009), higher incidences of asthma (Ernst & Cormier, 2000), and have parents with high rates of psychosocial problems (Polaha et al., 2011). More research is needed to address the specific and unique needs of the rural pediatric population, and how clinicians in integrated primary care can provide psychosocial and mental health support to these children and their families.

The second layer puts the findings of the aforementioned exploratory research into practice. At this level, interventions must be formulated to target the issues identified in the discovery process (the first layer) and should be brief, systemic (involving the family), and integrated (Miller, Kessler, Peek, & Kallenberg, 2011). It is here that the efficacy of the interventions should be established using a control group, randomized controlled trial (or equivalent design), with a manualized intervention. A sample research question might be, “Does the implementation of ‘Intervention X’ on the pediatric patient and his or her caretaker/parent influence the [stress level, well-being, anxiety level, etc] of the parent as compared to usual care?” Research targeted toward a single intervention (as compared to a multiple-step program) may be more beneficial for future research until empirical evidence for individual interventions has been established.

The third layer of research should be focused on the effectiveness of interventions in “real-world” clinical settings, also with adequate control samples. As with efficacy trials in the second layer, careful attention should be paid to the fidelity of the interventions to assure consistency across providers. Patient characteristics (e.g., age, ethnicity, special health needs [such as chronic illness]) should also be clearly reported for the purposes of generalizability and insight into the rural populations. Mixed-methods research might also be used at this layer to explore further the depth, merits, and drawbacks of interventions from the perspective of the patients, families, and providers.

Limitations

There were several limitations to this systematic review. First, the search was completed only on published data in peer reviewed journals. Second, the researchers attempted to do a thorough search using many possible combinations of search terms, but there is always the possibility of missing articles based on search terms not considered or human error. However, in an attempt to reduce human error, two research assistants reviewed the articles with the first author to assess if the inclusion criteria were met. In the case of a disagreement, three researchers met and deliberated until a consensus was reached.

In conclusion, integrating behavioral health and primary care is gaining popularity in the health care system (e.g., Dickens, Lancaster, & Crosbie, 2012; Honigfeld & Nickel, 2010; Kelleher & Stevens, 2009). Behavioral health clinicians need to be prepared, especially in the pediatric realm, with empirically based brief techniques that can be done in the clinic setting. Using a family-centered approach may help the providers to efficiently and effectively impact change, strongly influencing the child's overall well-being (Coleman & Howard, 1995).

REFERENCES

Adams, J., & Kagnoff, M. (1983). Development of pediatric secondary psychosocial care in a health maintenance organization. *Children's Health Care, 12,* 4-10.

Allen, K. D., Elliot, A.J., & Arndorfer, R. E. (2002). Behavioral pain management for pediatric Headache in primary care. *Children's Health Care, 31,* 175-189.

Allen, K.D., & Mathews, J.R. (1998). Behavioral management of recurrent pain in children. In T.S. Watson & F.M. Gresham (Eds.), *Handbook of child behavior therapy* (p. 263-285). New York: Plenum.

Arndorfer, R.E., Allen, K.D., & Aljazireh, L. (1999). Behavioral health need in pediatric medicine and the acceptability of behavioral solutions: Implications for behavioral psychologists. *Behavioral Therapy, 30*, 137-148.

Bilfield, S., Wildman, B.G., & Karazsia, B.T. (2006). Brief report: The relationship between chronic illness and identification and management of psychosocial problems in pediatric primary care. *Journal of Pediatric Psychology, 31*, 813-817.

Blount, A. (2003). Integrated primary care: Organizing the evidence. *Families, Systems & Health, 21,* 121-133.

Blount, A., Shoenbaum, M., Kathol, R., Rollman, B.L., Thomas, M., O'Donohue, W., et al., (2007). The economics of behavioral health services in medical settings: A summary of the evidence. *Professional Psychology: Research and Practice, 38,* 290-297.

Brown, J.D., Riley, A.W., & Wissow, L.S. (2007). Identification of youth psychosocial problems during pediatric primary care visits. *Administrative Policies in Mental Health and Mental Health Services Research, 34,* 269-281.

Campbell, C.D., Kearns, L.A., & Patchin, S. (2006). Psychological needs and resources as perceived by rural and urban psychologists. *Professional Psychology: Research and Practice, 37,* 45-50.

Celano, M.P. (2006). Family processing in pediatric asthma. *Current Opinion in Pediatrics, 18,* 539-544.

Coleman, W.L., & Howard, B.J. (1995). Family-focused behavioral pediatrics: Clinical techniques for primary care. *Pediatrics in Review, 16,* 448-455.

Connor, D.F., McLaughlin, T.J., Jeffers-Terry, M., O'Brien, W., Stille, C.J., Young, L.M., & Antonelli, R.C. (2006). Targeted child psychiatric services: A new model of pediatric primary clinician-child psychiatry collaborative care. *Clinical Pediatrics, 45,* 423-434.

Cooper, H. (2010). *Research synthesis and meta-analysis: A step-by-step approach* (4th ed.). Thousand Oaks, CA: Sage Publications, Inc.

Cooper, S., Valleley, R.J., Polaha, J., Bejeny, J., & Evans, J.H. (2006). Running out of time: Physician management of behavioral health concerns in rural pediatric primary care. *Pediatrics, 118,* e132-e138.

Dickens, R. S., Lancaster, M.S., & Crosbie, K. (2012). Primary care/behavioral health integration efforts in North Carolina. *North Carolina Medical Journal, 73,* 204-208.

Doherty, W.J., McDaniel, S. H., & Baird, M.A. (1996). Five levels of primary care/behavioral healthcare collaboration. *Behavioral Healthcare Tomorrow, 5,* 25-28.

Doherty, W.J., & Mendenhall, T. J. (2006). Citizen health care: A model for engaging patients, families, and communities as coproducers of health. *Families, Systems, & Health, 24,* 251-263.

Engel, G. L. (1977). The need for a new medical model: a challenge for biomedicine. *Science, 196,* 129–136.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry, 137,* 535-544.

Erickson, S.J., Gerstle, M., & Feldstein, S. W. (2005). Brief interventions and motivational interviewing with children, adolescents, and their parents in pediatric health care settings. *Archives of Pediatric and Adolescent Medicine, 159,* 1173-1180.

Ernst, P., & Cormier, Y. (2000). Relative scarcity of asthma and atopy among rural adolescents raised on a farm. *American Journal of Respiratory Critical Care Medicine, 161,* 1563-1566.

Finney, J. W., Lemanek, K.L., Cataldo, M.F., Katz, H.P., & Fuqua, R. W. (1989). Pediatric psychology in primary health care: Brief targeted therapy for recurrent abdominal pain. *Behavioral Therapy, 20,* 283-291.

Finney, J.W., Riley, A.W., & Cataldo, M.F. (1991). Psychology in primary health care: Effects of brief targeted therapy on children's medical care utilization. *Journal of Pediatric Psychology, 16,* 447-461.

Garfunkel, L.C., Pisani, A. R., leRoux, P., et Phil, D., & Siegel, D. M. (2011). Educating residents in behavioral health care and collaboration: Comparison of conventional and integrated training models. *Academic Medicine, 86,* 174-179.

Honigfeld, L., & Nickel, M. (2010). *Integrating behavioral health and primary care: Making it work in four practices in Connecticut*. Farmington, CT: Child Health and Development Institute of Connecticut.

Hortz, B., Stevens, E., Holden, B., & Petosa, R.L. (2009). Rates of physical activity among Appalachian adolescents in Ohio. *The Journal of Rural Health, 25,* 58-61.

Hunter, C. L., Goodie, J.L., Oordt, M.S., & Dobmeyer, A.C. (2010). *Integrated Behavioral Health in Primary Care.* American Psychological Association: Washington, DC.

Husky, M.M., Miller, K., McGuire, L., Flynn, L., & Olfson, M. (2010). Mental health screening of adolescents in pediatric practice. *Journal of Behavioral Health Services & Research, 38,* 159-169.

Jellinek, M.S., Murphy, J.M., Little, M., Pagano, M.E., Comer, D.M., & Kelleher, K.J. (1999). Use of the pediatric symptom checklist to screen for psychosocial problems in pediatric primary care: A national feasibility study. *Archives of Pediatric and Adolescent Medicine, 153*, 254-260.

Kelleher, K.J., McInerny, T.K., Gardner, W.P., Childs, G.E., & Wasserman, R.C. (2000). Increasing identification of psychosocial problems: 1979-1996.*Pediatrics, 82,* 1313-1321.

Kelleher, K.J., & Stevens, J. (2009). Evolution of child mental health services in primary care. *American Academy of Pediatrics, 2009,* 7-14.

Kolko, D.J., Campo, J.V., Kelleher, K. & Cheng, Y. (2010). Improving access to care and clinical outcome for pediatric behavioral problems: A randomized trial of a nurse-administered intervention in primary care. *Journal of Developmental & Behavioral Pediatrics, 31,* 393-404.

Kramer, T., & Garralda, M.E. (2000). Child and adolescent mental health problems in primary care. *Journal of Continuing Professional Development, 6,* 287-294.

Meadows, T., Valleley, R., Haack, M.K., Thorson, R., & Evans, J. (2011). Physician "costs" in providing behavioral health in primary care. *Clinical Pediatrics, 50,* 447-455.

Minkovitz, C.S., Hughart, N., Strobino, D., Scharfstein, D., Grason, H., Hou, W., Miller, T., Bishai, D., Augustyn, M., McLearn, K.T., &Guyer, B. (2003). A practice-based intervention to enhance quality of care in the first 3 years of life: The healthy steps for young children program. *Journal of the American Medical Association, 290,* 3081-3091.

Miller, B.F., Kessler, R., Peek, C.J., & Kallenberg, G.A. (2011). *A national agenda for research in collaborative care: Establishing the research agenda for collaborative care*. (AHRQ Publication No. 11-0067). Agency for Healthcare Research and Quality: Rockville, MD. Retrieved from: http://www.ahrq.gov/research/collaborativecare/collab1.htm

Oliansky, D.M., Wildenhaus, K.J., Manlove, K., Arnold, T., &Schoener, E.P. (1997). Effectiveness of brief interventions in reducing substance use among at-risk primary care patients in three community-based clinics. *Substance Abuse, 18,* 95-103.

Pidano, A.E., Marcaly, K.H., Ihde, K.M., Kurowski, E.C., & Whitcomb, J.M. (2011). Connecticut's enhanced care clinic initiative: Early returns from pediatric-behavioral health partnerships. *Families, Systems, & Health, 29,* 138-143.

Polaha, J., Dalton, W.T., & Allen, S. (2011). The prevalence of emotional and behavioral problems in pediatric primary care serving rural children. *Journal of Pediatric Psychology, 36,* 652-660.

Poston, W.S.C., Haddock, C.K., Pinkston, M.M., Pace, P., Reeves, R.S., Karakoc, N., et al., (2006). Evaluation of a primary care-oriented brief counseling intervention for obesity with and without orlistat. *Journal of Internal Medicine, 260,* 388-398.

Price, D., Beck, A., Nimmer, C., &Bensen, S. (2000). The treatment of anxiety disorders in a primary care HMO setting. *Psychiatric Quarterly, 71,* 31-45.

Robinson, P. (1998). Behavioral health services in primary care: A new perspective for treating depression. *Clinical Psychology: Science and Practice, 5,* 77-93.

Sanders, M.R., Turner, K.M.T., & Markie-Dadds, C. (2002). The development and dissemination of the Triple P-Positive Parenting program: A multilevel, evidence-based system of parenting and family support. *Prevention Science, 3,* 173-189.

Turner, K. M.T., & Sanders, M. R. (2006). Help when it's needed first: A controlled evaluation of brief, preventive behavioral family intervention in a primary care setting. *Behavior Therapy, 37,* 131-142.

Valentine, J.C. & Cooper, H. (2008). A systematic and transparent approach for assessing the methodological quality of intervention effectiveness research: The study design and implementation assessment device (Study DIAD). *Psychological Methods, 13,* 130-149.

Valleley, R.J., Kosse, S., Schemm, A., Foster, N., Polaha, J., & Evans, J. (2007). Integrated primary care for children in rural communities: An examination of patient attendance at collaborative behavioral health services. *Families, System, & Health, 25,* 323-332.

Walker, Z., Townsend, J., Oakley, L., Donovan, C., Smith, H., Hurst, Z., Bell, J., & Marshall, S. (2002). Health promotion for adolescents in primary care: Randomised controlled trial. *British Medical Journal, 325,* 1-6.

Zuckerman, B., Kaplan-Sanoff, M., Parker, S., & Young, K.T. (1997). The healthy steps for young children program. *Zero to Three, 17,* 20-25.

Table 1

Article Search Summary

PsychINFO via EBSCO	**Medline via PubMed**	**Academic Search Complete via EBSCO**	**Biomedical Reference Collection: Comprehensive**
Integrated Primary Care AND Pediatrics Yield: 3 Found: 1	*Integrated Primary Care AND Pediatrics* Yield: 0 Found: 0	*Integrated Primary Care AND Pediatrics* Yield: 1 Found: 0	*Integrated Primary Care AND Pediatrics* Yield: 0 Found: 0
Integrated Care AND Pediatrics AND Primary Care Yield: 6 Found: 0	*Integrated Care AND Pediatrics AND Primary Care* Yield: 1 Found:0	*Integrated Care AND Pediatrics AND Primary Care* Yield: 3 Found: 0	*Integrated Care AND Pediatrics AND Primary Care* Yield: 3 Found:0
Collaborative Care AND Pediatrics Yield: 17 Found: 7	*Collaborative Care AND Pediatrics* Yield: 14 Found: 3 Duplicates: 1	*Collaborative Care AND Pediatrics* Yield: 16 Found: 1 Duplicates: 3	*Collaborative Care AND Pediatrics* Yield: 8 Found: 0 Duplicates: 1
Patient Centered Medical Home AND Pediatrics Yield: 1 Found: 0	*Patient Centered Medical Home AND Pediatrics* Yield: 1 Found: 0	*Patient Centered Medical Home AND Pediatrics* Yield: 14 Found: 1	*Patient Centered Medical Home AND Pediatrics* Yield: 4 Found: 0 Duplicates: 1
Patient Centered Medical Home AND Pediatrics AND Mental Health Yield: 1 Found: 0	*Patient Centered Medical Home AND Pediatrics AND Mental Health* Yield: 0 Found: 0	*Patient Centered Medical Home AND Pediatrics AND Mental Health* Yield: 2 Found: 0	*Patient Centered Medical Home AND Pediatrics AND Mental Health* Yield: 0 Found: 0
Behavioral Health AND Pediatrics Yield: 201 Found: 20 Duplicates: 1	*Behavioral Health AND Pediatrics* Yield: 70 Found: 3 Duplicates: 4	*Behavioral Health AND Pediatrics* Yield: 271 Found: 1 Duplicates: 6	*Behavioral Health AND Pediatrics* Yield: 120 Found:1 Duplicates: 2
Behavioral Health AND Pediatrics AND Primary Care Yield: 39	*Behavioral Health AND Pediatrics AND Primary Care* Yield: 20	*Behavioral Health AND Pediatrics AND Primary Care* Yield: 36	*Behavioral Health AND Pediatrics AND Primary Care* Yield: 20

Found: 2 Duplicates: 13	Found: 0 Duplicate: 7	Found: 1 Duplicates: 4	Found: 1 Duplicates: 2
Psychosocial AND Pediatrics AND Primary Care Yield: 125 Found: 5 Duplicates: 4	*Psychosocial AND Pediatrics AND Primary Care* Yield: 131 Found: 11 Duplicates: 4	*Psychosocial AND Pediatrics AND Primary Care* Yield: 75 Found: 3 Duplicates: 6	*Psychosocial AND Pediatrics AND Primary Care* Yield: 52 Found: 0 Duplicates: 5
Collaboration AND Pediatrics AND Mental Health Yield: 161 Found: 7 Duplicates: 3	*Collaboration AND Pediatrics AND Mental Health* Yield: 25 Found: 1	*Collaboration AND Pediatrics AND Mental Health* Yield: 51 Found: 1 Duplicates: 2	*Collaboration AND Pediatrics AND Mental Health* Yield: 20 Found: 0 Duplicates: 1
Behavioral Medicine AND Pediatrics Yield: 302 Found: 9 Duplicates: 2	*Behavioral Medicine AND Pediatrics* Yield: 121 Found: 7 Duplicates: 1	*Behavioral Medicine AND Pediatrics* Yield: 253 Found: 6 Duplicates: 0	*Behavioral Medicine AND Pediatrics* Yield: 92 Found: 1 Duplicates: 1
Integrated Medical Care AND Children Yield: 0 Found: 0	*Integrated Medical Care AND Children* Yield: 0 Found: 0	*Integrated Medical Care AND Children* Yield: 3 Found: 0	*Integrated Medical Care AND Children* Yield: 1 Found: 0
Integrated Primary Care AND Psychosocial AND Children Yield: 1 Found: 0	*Integrated Primary Care AND Psychosocial AND Children* Yield: 0 Found: 0	*Integrated Primary Care AND Psychosocial AND Children* Yield: 1 Found: 0	*Integrated Primary Care AND Psychosocial AND Children* Yield: 1 Found: 1
Integrated health care AND Children Yield: 14 Found: 2 Duplicates: 1	*Integrated health care AND Children* Yield: 19 Found: 0 Duplicates: 1	*Integrated health care AND Children* Yield: 95 Found: 2 Duplicates:1	*Integrated health care AND Children* Yield: 30 Found: 1 Duplicates: 1
Patient Centered Medical Home AND Children Yield: 3 Found: 0	*Patient Centered Medical Home AND Children* Yield: 4 Found: 0	*Patient Centered Medical Home AND Children* Yield: 12 Found: 0	*Patient Centered Medical Home AND Children* Yield: 3 Found: 0

Patient Centered Medical Home AND Children AND Mental Health Yield: 3 Found: 0	*Patient Centered Medical Home AND Children AND Mental Health* Yield: 1 Found: 0	*Patient Centered Medical Home AND Children AND Mental Health* Yield: 7 Found: 0	*Patient Centered Medical Home AND Children AND Mental Health* Yield: 3 Found: 0
Behavioral Medicine AND Children AND Primary Care Yield: 15 Found: 2	*Behavioral Medicine AND Children AND Primary Care* Yield: 21 Found: 2 Duplicates: 3	*Behavioral Medicine AND Children AND Primary Care* Yield: 26 Found: 1	*Behavioral Medicine AND Children AND Primary Care* Yield: 13 Found : 1
Behavioral Health AND Children AND Primary Care Yield: 45 Found: 1 Duplicates: 10	*Behavioral Health AND Children AND Primary Care* Yield:24 Found: 0 Duplicates: 6	*Behavioral Health AND Children AND Primary Care* Yield: 26 Found: 0 Duplicates: 1	*Behavioral Health AND Children AND Primary Care* Yield: 300 Found:1 Duplicates: 5
Psychosocial Intervention AND Children AND Primary Care Yield: 3 Found: 1 Duplicates: 1	*Psychosocial Intervention AND Children AND Primary Care* Yield:5 Found: 0 Duplicates: 2	*Psychosocial Intervention AND Children AND Primary Care* Yield: 3 Found: 0 Duplicate: 1	*Psychosocial Intervention AND Children AND Primary Care* Yield: 1 Found:0
Collaborative Care AND Children AND Mental Health Yield: 19 Found: 0 Duplicates: 3	*Collaborative Care AND Children AND Mental Health* Yield: 9 Found: 0 Duplicates: 2	*Collaborative Care AND Children AND Mental Health* Yield: 75 Found : 1 Duplicates: 1	*Collaborative Care AND Children AND Mental Health* Yield: 18 Found:0
Integrated Medical Care AND Children Yield: 0 Found: 0	*Integrated Medical Care AND Children* Yield: 0 Found: 0	*Integrated Medical Care AND Children* Yield: 3 Found: 0	*Integrated Medical Care AND Children* Yield: 1 Found: 0
Integrated Care AND Psychosocial AND Children Yield: 2 Found: 0 Duplicates: 1	*Integrated Care AND Psychosocial AND Children* Yield: 2 Found: 0	*Integrated Care AND Psychosocial AND Children* Yield: 7 Found: 0	*Integrated Care AND Psychosocial AND Children* Yield: 1 Found: 0

Integrated health care AND Children Yield: 14 Found: 0 Duplicates	*Integrated health care AND Children* Yield: 19 Found: 0 Duplicates: 1	*Integrated health care AND Children* Yield: 95 Found: 1 Duplicates: 2	*Integrated health care AND Children* Yield: 30 Found: 0 Duplicates: 3
Community health AND Pediatric AND Intervention Yield: 28 Found: 3	*Community health AND Pediatric AND Intervention* Yield: 128 Found: 1	*Community health AND Pediatric AND Intervention* Yield: 186 Found: 8	*Community health AND Pediatric AND Intervention* Yield: 71 Found: 1 Duplicates: 3
FQHC and Pediatric and Intervention Yield: 0 Found: 0	*FQHC and Pediatric and Intervention* Yield: 1 Found: 0	*FQHC and Pediatric and Intervention* Yield: 1 Found: 0	*FQHC and Pediatric and Intervention* Yield: 1 Found: 0 Duplicates: 1
Total: 1003 Total Duplicates Excluded: 42	Total: 616 Total Duplicates Excluded: 32	Total: 1,262 Total Duplicates Excluded: 27	Total: 793 Total Duplicates Excluded: 26
Final Total for Abstract/In-Depth Review: 60	Final Total for Abstract/In-Depth Review: 28	Final Total for Abstract/In-Depth Review: 27	Final Total for Abstract/In-Depth Review: 8
Total for in-depth abstract/full text review from all databases: 124			
Total articles that meet final criteria: 5			

Table 2

Article Summaries

Article	**Intervention**	**Administered By**	**Sample Size**	**Participants Characteristics**	**Rural, Suburban or Urban**	**Systemic**	**Outcome**
				Behavioral Interventions			
Minkovitz et al., (2003)	Healthy Steps for Young Children Program (seven different services for families)	“Healthy Steps Specialists” (nurses, nurse practitioners, early childhood educators, and social workers),and Physicians	n= 5565	Children were followed from newborn to 3 years, majority of mothers of children were white, educated, married, and employed. The study sites were: Allentown, PA; Amarillo, TX; Florence, SC; Iowa City, IA; Pittsburgh, PA; San Diego, CA; Boston, MA; Grand Junction, CO; Montrose, CO; Kansas City, KS; Kansas City MO; New York, NY; and Richmond, TX	Urban	Yes	Intervention group saw increased use of favorable discipline techniques, such as reduced likelihood of slapping their child in the face or spanking (for randomization and quasi-experimental sites, respectively: OR, 0.82 [95% CI, 0.54 to 1.26] and OR, 0.67 [95% CI, 0.46 to 0.97]), and also had an increased odds of negotiating and ignoring. For mothers with depressive symptoms, a greater number of intervention mothers than control mothers reported sadness to someone in the practice, at about two times greater rate (OR, 0.95 [95% CI, 0.56 to 1.63] and OR, 2.82 [95% CI, 1.57 to 5.08]).
Turner & Sanders (2006)	Primary Care Triple P, a preventative behavioral family program	Child health nurses	n=30	Children were from a low-income area of Brisbane, Australia; 80% from two-parent families; mean age (in months) 37.25(*SD*= 10.27	Urban	Yes	Intervention group reported significantly lower rates of the target problem child behaviors than those on the wait-list control, and higher satisfaction for mothers in the parenting role.

			Biomedical Interventions				
Allen et al., (2002)	Children participated in biofeedback for headaches	Master's level behavioral health clinicians	n=7	Children aged 8-16 who suffered from frequent headaches, 3 males and 4 females	Unclear	Limited	6 of 7 children saw reductions in headache parameters. Parents reported significantly less pain interference on their child's functioning in daily chores, school, schoolwork, and recreational activities following treatment, *t*(6) = 4.08, *p*<.0.
Finney et al., (1989)	Multi-dimensional intervention targeting abdominal pain	Psychologists	n=16	Children aged 6-13 with recurrent abdominal pain (M = 11 years 3 months), 6 males and 10 females	Suburban	Yes	81% of parents reported children improved or resolved at follow-up. There were significant differences between groups for rates of overall medical visits [*F*(1,30) = 6.63, *p*<.02] and for medical visits with a diagnosis of recurrent abdominal pain [*F*(1,30) = 10.45, *p*<.005]. For the treatment group, overall medical visits showed a significant decrease [*t*(15) = 2.47, *p*<.01] from the 1.41 visits per month before treatment to .67 visits after treatment. The untreated group showed a nonsignificant increase [*t*(15) = -0.86, *p*<.20] in overall medical care utilization, with an initial average of .81 (*SD*= .63) visits per month compared to the later .96 (*SD*= .81) visits per month.

Behavioral and Biomedical Interventions							
Walker et al., (2002)	20 minute consultation with a nurse to discuss health/health related behavior	Practice nurses	n= 970	British adolescents between the ages of 14-15 (M=14.8), 49% male, 89% White, 73% lived with both natural parents, 48% were from families in “professional” SES group	Urban	No	At the three month follow-up, more participants in the intervention group than in the control group reported positive change in at least one of the four areas of health related behavior (16% versus 14%; χ^2 = 3.59, df=1, *p*=.06). There was no significant difference at the twelve month follow up. At the three month follow up, significantly more intervention participants reported positive movement on the stages of change for at least one of the four key behaviors (χ^2 = 2.93, df=1, *p*<.01). No significant differences were shown at the twelve month follow-up. In the follow up year intervention participants reported fewer visits to their general practitioner than did controls (1.74 versus 2.05; -0.64 to 0.02; p =0.06).

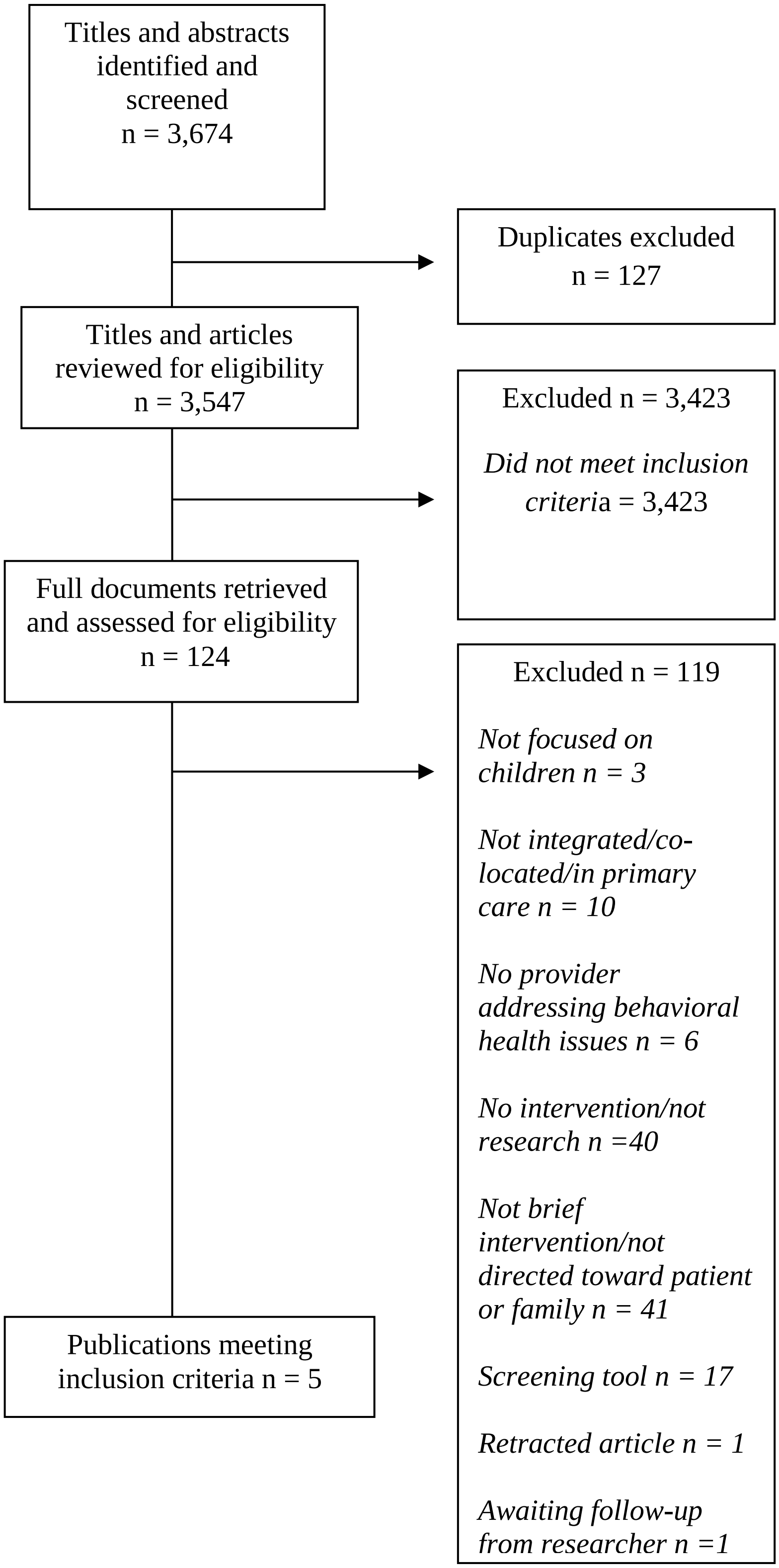
Table 3

*Article Analysis: Study Quality Criteria**

Author, (Year)	**Were the participants treated consistently with the definition of intervention?**	**Were outcomes measured in a way consistent with proposed effects of intervention?**	**Were treatment group participants comparable to comparison group?**	**Was the study free of events that happened at the same time possibly confounding the effects?**	**Did the study include variation on participants, etc., represented of intended beneficiaries?**	**Was the intervention tested for effect within subgroups of participants, etc.?**	**Were effect sizes and their standard errors accurately estimated?**	**Were statistical tests adequately reported?**	**Final Score**
Allen et al., (2002)	1	1	0**	1	0	0	0	1	4
Finney et al., (1989)	1	1	1	1	0	0	0	1	5
Minkovitz et al., (2003)	1	1	1	1	1	1	1	1	8
Turner & Sanders (2006)	1	1	1	1	1	1	1	1	8
Walker et al., (2002)	1	1	1	0	1	1	1	1	7

Note: ‘1’ signifies that the author met the stated criteria, whereas ‘0’ indicates the criteria have not been met.
*Adapted from Valentine & Cooper (2008).
**Indicates no comparison group.

Figure 1. Flow chart of included articles for review.



CHAPTER 3: PARENTAL INFLUENCES ON CHILD HEALTH CARE UTILIZATION: A REVIEW OF THE LITERATURE

The reformation of the health care system in the United States has put great focus on minimizing cost while amplifying benefits for stakeholders, including policy makers, medical providers, and patients (Romaire, Bell, & Grossman, 2012). More traditional models of health care that divide care systems (e.g., medical and psychosocial) are not leading to gains in health care quality or outcomes. Instead, these systems must be integrated in order to improve cost-effectiveness, as well as quality and efficiency (Laraque & Sia, 2010). The American Academy of Pediatrics (1992) has endorsed one example of an integrated model of care, also known as the medical home (Laraque & Sia, 2010). The medical home is defined as "access to family-centered, community-based, coordinated care directed or delivered by a primary care physician offering comprehensive, continuous, culturally effective, and compassionate care" (Laraque & Sia, 2010, p. 2407). For children, the medical home has been associated with increased health-promoting behaviors, better parental assessment of health, and improved patterns of health care utilization (e.g., decreased odds of having an outpatient sick visit and having an emergency department sick visit) (Long, Bauchner, Sege, Cabral & Garg, 2012).

These patterns of health care utilization are of specific interest in this current review. Whereas involvement in a medical home has been found to be one facet of improving health care utilization (Long et al., 2012), researchers indicate a variety of influences on child health care utilization such as child health status (Janicke & Finney, 2001), maternal use of health care (Janicke, Finney & Riley, 2001), and family issues, such as parental psychosocial stress (Moran & O'Hara, 2006). In order to continue serving children and their families with quality health care that is cost-effective, it is necessary to understand and address the different components that influence utilization.

Researchers suggest that the greatest factor in determining pediatric health care use is the child's health status, measured by the presence or absence of a medical diagnosis, or by parental ratings of the child's health (Janicke & Finney, 2001). In additional to physical health concerns, child psychosocial concerns are also associated with increased health care use (Janicke & Finney, 2003). When addressing pediatric physical or psychosocial concerns, it is generally only the child who is the focus of treatment (Olfson, Marcus, Druss, Pincus, &Weissman, 2003). However, there is evidence that these physical and psychosocial issues do not always occur in isolation of the child and may be influenced by other systemic issues. For example, "Parents who are more anxious may be more likely to have children who experience psychological and physiological (i.e., pain, somatic symptoms) distress" (Loiselle et al., 2012, p. 822). Loiselle continues to explain the systemic component at play in child health care utilization, "Furthermore, high health care utilization may be part of a larger internalizing pattern of behavior within the family" (Loiselle et al., 2012, p. 822). Loiselle's sentiments have been supported in the literature of child health care utilization. For example, "Children of parents with depression are at increased risk for numerous mental health problems and increased general and mental health service utilization and cost" (Olfson, et al., 2003, p. 720). In order to provide a framework for understanding the influences of multiple systems on pediatric health and health care utilization, the biopsychosocial model (BPS; Engel, 1977, 1980) will be used as a guide for this review.

Biopsychosocial Model

An alternative to the more dominant biomedical model, the biopsychosocial (BPS) model was introduced by Engel (1977) to provide a more systemic perspective at approaching health care. Compared to the biomedical model in health care, the BPS model is based on a systems approach (von Bertalanffy, 1968) and acknowledges that humans cannot be reduced or isolated to a single issue or diagnosis (Engel, 1980). Instead, humans are part of a dynamic system, and each person "represents at the same time the highest level of the organismic hierarchy and the lowest level of the social hierarchy" (Engel, 1980, p. 537). Therefore, nothing exists in isolation; one cannot experience a biological problem without having some sort of psychological and social impact (Engel, 1977). When working through a BPS lens, "social and psychological as well as biological factors" are taken into account to gain a more comprehensive picture of health (Engel, 1977). A BPS lens in child health care research provides a systemic perspective to conceptualize potential factors in utilization, going beyond a singular, biomedical approach.

Parental Influence on Child Health Care Utilization

As previously mentioned, researchers support the influence of certain family characteristics on child health care utilization (Moran & O'Hara, 2006). For example, several parental characteristics have been researched in conjunction to child health care utilization, such as parental depression (Olfson et al., 2003), parental self-efficacy, stress (Janicke & Finney, 2003), and family conflict (Riley et al., 1993). There have been many explanations offered regarding the relationship between parental characteristics and pediatric health care use, such as "…depressed and anxious mothers may seek pediatric treatment at least partially in an attempt to reduce personal distress, whether or not they believe it is attributable to child illness" (Moran & O'Hara, 2006, p. 174). However, there are mixed findings on the influence of some of these characteristics, possibly due to the way in which researchers have measured parental characteristics and child health care use (Moran & O'Hara, 2006). For example, there may be a lack of differentiation in the research design between preventative health care use and sick visit health care use for some studies and not others.

Additionally, sample differences may explain some variability in the results. Recent research indicates that rural children experience additional health issues and disparities when compared to their non-rural counterparts (Polaha, Dalton, & Allen, 2011). Children in rural areas are more likely to have a sedentary lifestyle (Hortz, Stevens, Holden, & Petosa, 2009), higher incidences of asthma (Ernst & Cormier, 2000), and have parents with high rates of psychosocial problems (Polaha et al., 2011). In rural areas, availability of health care is also unique, as "There are persistent shortages of pediatricians and other primary care providers in rural areas" (Farmer, Clark, Sherman, Marien, & Selva, 2005, p. 649), possibly influencing health care utilization.

Aims of Literature Review

This review aims to: 1) analyze research-based literature on the parental influences on child health care utilization, and 2) identify the research that has been done on rural populations regarding parental influences on child health care utilization. The results will be used to highlight themes across studies and target opportunities for future research.

Definition of Terms

The following terms were used in creation of this literature review:

- "Patient" refers to the pediatric patient 17 years and younger who is the focus of treatment/care.
- "Parent" refers to the biological or adoptive parent or legal guardian of the patient.

- “Parental characteristics” include any component of the parent that is being measured with child health care utilization; this may include psychosocial components such as anxiety, stress, or social support, or physical components such as overall health.
- “Health care utilization” refers to the frequency a patient seeks medical care, either at a primary care clinic or an after-hours/emergency clinic.
- “Rural” refers to geographic areas located outside of cities and towns, not included in an urban area, with a low population density and small settlements.

Methodology for Review of Literature

In this non-systematic review of the critical literature, the following databases were searched: Google Scholar, Medline via PubMed, and PsychInfo via EBSCO. The following key words formed the list of search terms used to identify the relevant literature in the first phase of the search: ‘health care utilization,’ ‘children,’ ‘child,’ ‘pediatric,’ ‘influences’ and ‘parent.’ The inclusion criteria were research studies: 1) published in English, 2) published in peer-reviewed journals, 3) utilization data included primary care or emergency/after-hours care clinics in the United States, 4) involved at least one characteristic of the patient’s parent/guardian (e.g., stress level, depression, etc), 5) published between 2000 and 2012. This time period was selected to obtain only the most recent and pertinent literature on parental influences on child health care utilization.

Additional studies were excluded if there was not a systemic component (e.g., did not look at both parent factors *and* child health care utilization), or if the research was done only on a specialized illness population (e.g., in children with asthma, or children presenting with only one symptom such as chest pain). The initial search yielded 119 articles; a review of the titles and abstracts yielded 16 articles that met the inclusion criteria to be considered for full text review.

The second phase of the search involved examining the reference lists of the articles found in the first phase for relevant articles; nine additional articles were found for a total of 25 articles to be considered for review. After a full text review of these articles and application of the inclusion criteria, 12 articles met the full criteria and were included in this review (see Table 1 for a summary of the articles).

Results

The articles included in this literature review have been organized into the following categories based on the outcome variables of the studies: 1) Preventative Health Care Utilization, 2) Problem-Based Health Care Utilization, and 3) Both Preventative and Problem-Based Health Care Utilization (see Table 1).

Preventative Health Care Utilization

Two studies examined parental influences on child preventative health care utilization (Gorman & Braverman, 2008; Hughes & Wingard, 2007). Gorman and Braverman (2008) researched the influence of family structure on the child's access to the medical care system. The authors explain family structure as contrasting between children living with "married biological/adoptive parents" and "children living with a single mother, single father, cohabiting parents, parent and step-parent, or parent(s) and other related adults" (Gorman & Braverman, 2008, p. 1769). Barriers to medical care were measured using a set of questions, (e.g., was care ever delayed in the past year because one "(a) couldn't get through on the telephone, (b) couldn't get an appointment soon enough...") (Gorman & Braverman, 2008, p. 1769). Demographic characteristics, socioeconomic status, and child health status were also measured.

Researchers suggest that children living with two married parents were more likely to have had a routine well-child visit in the past year (72%), though this was not significantly different from children living with a single mother, (70.8%) it was significantly different from children living with a single father (59.1%) (Gorman & Braverman, 2008). Children with cohabiting parents or single mothers were more likely to experience reported barriers to health care, even after controlling for SES and demographic characteristics (Gorman & Braverman, 2008).

While this study provided useful information regarding the influence of family structure on child preventative health care utilization, there are several limitations to the study. Primarily, child health care utilization was based on anecdotal evidence instead of actual count data. Although anecdotal evidence can be of value in health care research, “anecdotal information should not be considered as a replacement for, but as a complement to formal research evidence” (Enkin & Jadad, 1998, p. 963). Count data in conjunction to anecdotal evidence may provide a stronger methodology in future studies.

The second article examined the association between children’s receipt of preventative health care influence and parental beliefs about routine care (Hughes & Wingard, 2007). Data were gathered via a telephone survey from the “2001 United Way Outcomes and Community Impact Program” taking place in San Diego County, California (Hughes & Wingard, 2007, p. 289). Households in this area with children between the ages of 3-19 were included in the study; parents were asked whether or not the child visited a health care professional in the past 12 months for routine health care (e.g., well-child care, immunizations). Parents were also asked, “How often do you think your (son/daughter) should see a doctor or other health care professional for a regular or routine check-up?” (Hughes & Wingard, 2007, p. 290).

The authors reported a strong association between parents’ beliefs about the timing of health checks and children receiving recommended routine care. Other important factors associated with children’s routine care included parent’s level of education, whether or not the child has a regular source of health care, and if the child was sick in the previous 12 months (Hughes & Wingard, 2007).

The majority of the respondents in this study (taking place in an urban area) were female (69%), White non-Hispanic (60%), married or cohabiting (79%) and had at least some college education (73%); these characteristics may not adequately represent those in rural areas. Additionally, the data collected were anecdotal evidence based solely on parental report, lending itself to reporting and recall biases.

Problem-Based Health Care Utilization

Two articles focused on problem-based, or sick visit health care utilization (Flynn, Cain, O’Mahen, & Davis, 2006; Flynn, Davis, Marcus, Cunningham, & Blow, 2004). The first article (Flynn et al., 2006) examined the association between maternal alcohol use problems and child emergency department (ED) utilization. Participants included 361 English-speaking mothers over the age of 18 who brought a child seven years or younger to an urban emergency department for care. Mothers were excluded if their child was brought to the ED for a severe or life-threatening trauma.

Basic demographic information was collected (e.g., maternal age, educational attainment), with the TWEAK (a brief screening tool for alcohol use problems; Russell, 1994) as the main predictor variable and pediatric ED visits in the last six months as the outcome variable. The majority of participants were married or had a live-in partner (83%), were White non-Hispanic (74%), and had graduated high school or had some college (52%) (Flynn et al., 2006). The researchers indicated that participants with elevated TWEAK scores brought their children to the ED significantly more often than participants who did not have elevated TWEAK scores. Younger maternal age was also related to greater child ED use.

Though this study provided useful information about maternal alcohol use, the participants were only mothers; no information on the child's father was collected. Although the majority (83%) of participants reported being married or having a live-in partner, systemic information was not gathered (e.g., social support, relationship quality, concern about partner alcohol use). Additionally, child ED utilization was measured by anecdotal evidence as opposed to count data.

The second article focused on the influence of maternal depression and pediatric emergency department utilization (Flynn et al., 2004). English-speaking mothers (of children less than seven years of age) were approached in an urban ED. Depression was measured using the CES-D scale (Husaini, Neff, & McCorkel, 1980) and the RAND screening instrument (Rost, Burnam, & Smith, 1993). Child health care utilization was measured by asking about missed pediatric outpatient visits in the past year and number of visits to the ED for the child in the last six months.

Of the participants (n=176), the majority were White non-Hispanic (74%), were married or cohabiting (83%), and had at least some college, graduated college or continued education beyond college (64%). Thirty one percent of participants met the criteria for depression, and 78% reported they were not currently receiving treatment. Of the mothers meeting criteria for depression, a significantly higher frequency of ED visits were reported for their children, and they were more likely to report a missed doctor's appointment for their child in the previous year. Similar to the previous studies, the researchers did not independently verify children's health care utilization beyond the maternal reports. Additionally, mothers in the study were mostly white, educated, and in a relationship, and were in an urban-area, leaving the generalizability of the findings unclear.

Preventative and Problem-Based Health Care Utilization

Eight articles met the inclusion criteria for this review that looked at preventative and problem-based health care utilization (Holland, Yoo, Kitzman, Chaudron, Szilagyi, & Temkin-Greener, 2012; Janicke & Finney, 2003; Janicke, Finney, & Riley, 2001; Minkovitz et al., 2005; Olfson, Marcus, Druss, Pincus, & Weissman, 2003; Raphael, Zhang, Liu, & Giardino, 2009; Rivara et al., 2007; Sills, Shetterly, Xu, Magid, & Kempe, 2006). Holland and colleagues examined mother-child interactions (e.g., mother responsiveness to child and child responsiveness to mother), as measured by trained observers using the "Home Observation for Measurement of the Environment (HOME) and the Nursing Child Assessment Satellite Training (NCAST) when the child was 12 months old" and its association with health care utilization (as measured by record reviews of hospitalizations, ED visits, and sick- and well- child visits) (2012, p. 86).

Data were gathered from a previous trial examining Medicaid recipients in Memphis, TN from 1990-1991, and had to meet two of the following high risk criteria: 1) were unmarried, 2) were unemployed, or 3) had less than 12 years of education. A total of 432 mothers participated in this study. Basic demographic information was collected (e.g., education level, household density), along with level of social support (e.g., mother's male partner, the mother's mother), information about and chronic conditions for the child, and presence of depression in mothers (Holland et al., 2012). Researchers indicated that greater responsiveness from the mother directed toward the child was associated with fewer hospitalizations and ED visits. Both mother-child and child-mother responsiveness were associated with preventative care visits (e.g., well-child checks).

The participants in this group were mostly African American (92%), very low income (47.1%), and living in an urban area, which might limit the generalizability of the results to other populations. Additionally, though the study was published in 2012, the data were collected in 1990, potentially limiting the generalizability of the findings in the present day. It may be helpful for future studies to fully examine issues that influence mothers' responsiveness to their children (e.g., maternal stress level, depression, anxiety) in order to provide clinicians direction on interventions and support programs for mothers and patients, and to understand more about the relationship between psychological factors *and* social factors on health care utilization.

The second article (Janicke & Finney, 2003) examined parental social-cognitive factors (e.g., stress, parenting self-efficacy, distress) and child's primary health care use. A total of 87 primary caretakers of children (ages 4 to 9) were included in the study; a majority of the participants were white (89.7%), female/mother (94.3%), and married (87.4%). Participants were recruited through advertisements in local physician offices, elementary schools, and the university. The Parenting Self-Agency Measure (Dumka, Stoerzinger, Jackson, & Roosa, 1996) was used to measure parenting self-efficacy, the Social Environment Inventory (Orr, James & Charney, 1989) was used for stress, and the Brief Symptom Inventory was used to measure distress (Derogatis, 1993). Child health care utilization counts for the previous two years were obtained via direct chart review.

Although independently parenting self-efficacy and parental stress were not significant predictors of primary care use, the interaction between parental self-efficacy and stress was a significant predictor of pediatric primary care use (Janicke & Finney, 2003). Thus, when parents reported higher stress and daily hassles, self-efficacy impacted primary care use.

This was a relatively small sample size (n=87), and as previously mentioned, primary white, female, and married. Data were also collected in a non-rural area, impacting the generalizability of the data to a rural and diverse population. Additionally, participants had to contact the researchers to participate in the study and volunteer their time, possibly lending to participation bias (e.g., participants had more time to volunteer and might be under less stress in general than those who did not volunteer).

In the third study (Janicke, Finney, & Riley, 2001) researchers gathered psychosocial and family data from 367 mothers with children ages 5-11 years enrolled in an HMO. Mothers were given a study questionnaire while their children were weighed, checked for height, and given hearing and vision screenings. Basic demographic information was collected about the mother and child, along with measures of health using the Health Status Questionnaire (Eisen et al., 1979), family information using the Family Life Event Inventory (Ware et al., 1987) and the Family Environment Scale (Moos & Moos, 1981), maternal mental health using the Mental Health Index (Ware et al., 1987), child behavioral issues using the Child Behavior Checklist (Achenbach, 1991) and social support using the Social Support Questionnaire (Sarason, Sarason, Shearin & Pierce, 1987). Child health care utilization was measured by recording the number of visits the child made to the health plan for two years after the initial meeting (excluding laboratory and radiographic procedures).

The findings indicated that "past use of pediatric health care services is the best predictor of future health care use" (Janicke et al., 2001, p. 997). When past use was taken out of the model, mother's worry about child health was the strongest predictor of health care use. Higher self-reported maternal psychological well-being and emotional control were found to be related to lower child health care use.

The majority of the participants were white (86.2%), well-educated, married (92.2%) and middle to upper-middle class, and seeking care in a non-rural area through an HMO. These factors limit the generalizability of the findings to more diverse and rural families. Additionally, it appears as if the child health care utilization counts were not statistically differentiated between sick-child visits and well-child visits. This lack of distinction between preventative care and problem-based care may have influenced the results of the study (e.g., parents with more social support may be more likely to attend well-child visits and less likely to seek care when their child is only mildly ill). Finally, although the study itself was published in 2001, the data were collected in the late 1980's, possibly limiting the application of the findings to current populations.

The authors of the fourth article (Minkovitz et al., 2005) explored the relationship between maternal depression and child health care utilization. The current research was gathered as part of a larger clinical trial (Healthy Steps for Young Children; Guyer, Hughart, Strobino, Jones, & Scharfstein, 2000) and gathered data from fifteen Healthy Steps sites across the United States. Mothers (N=4874) were given a questionnaire to answer at enrollment in the program, interviewed via telephone twice between two to four months in the study period and 30-33 months . Medical records from birth to 32 months of age were reviewed of the children whose mothers participated in the study; counts for both preventative visits (e.g., well-child checks) and problem-based visits (e.g., urgent care/ED use) were collected. Basic demographic information was collected, along with a measure of maternal depressive symptoms using the Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977).

Researchers indicated that children with mothers who had depressive symptoms (at two to four months) were significantly less likely to receive age-appropriate well-child visits and regular vaccinations (Minkovitz et al., 2005). Mothers with depressive symptoms were also likely to report receiving care for their child an ED in the past year (as reported at 30-33 months) in comparison to mothers without depressive symptoms.

The participants were primarily white (59.4%), considered middle or high income (34.8% and 32.2%, respectively), and married to and living with the child's biological father (64.4%). It was unclear whether the sample was representative of rural populations, though the authors state that the "participants are economically and ethnically diverse" and believed to be generalizable. Additionally, the study only focused on mothers of children up to age three, possibly impacting generalizability to mothers of older children.

The authors of the fifth article (Olfson et al., 2003) examined the relationship between parental depression, child mental health problems, and child health care utilization. The data used in the article were previously collected as part of a national survey on health care use (1997 Medical Expenditure Panel Survey; Cohen, 2000). Participants were parents of children between the ages of three and 18 years, and were asked to keep a diary of health problems and medical events (e.g., accessing medical provider services) during the study year. Questions from the Short Form 36 (Ware & Shelbourne, 1992) were modified in order to assess for health and mental health status.

The researchers indicated that children of parents with depression were significantly more likely to have mental health issues, have made a medical visit and a mental health visit than children of parents without depression (Olfson et al., 2003). Children of parents with depression had "significantly higher mean medical and mental health expenditures" (Olfson et al., 2003, p.

718). No significant differences were found between maternal or paternal depression status and childhood physical or mental health problems.

Limitations to the article include self-report for parent depression, and no indication of the severity or range of the depression. Additionally, there was no indication that child health utilization was differentiated between preventative visits and problem-based visits (both primary care sick visits and urgent care/ED visits). Distinguishing between the types of visits may provide additional clues regarding the mechanisms of parental depression and child health care use.

In the sixth article (Raphael et al., 2009), researchers investigated the relationship between parenting stress and child health care utilization. Data were gathered from a 2003-2004 telephone survey, National Survey of Children's Health (NSCH) sponsored by the Maternal and Child Health Bureau of the Health Resources and Services Administration (Blumberg, Olson, Srinath, & Giambo, 2005). Households in each of the 50 states and the District of Columbia with children less than 18 years of age were random-digit-dialed, and respondents were the adults in the household "most knowledgeable about the sampled child's health and health care" (Raphael et al., 2009, p. 217). There were a total of 86,895 participants; overall demographic characteristics of participants (e.g., race/ethnicity, income) were not clearly reported in the article.

Questions regarding parenting stress were adapted from the Aggravation in Parenting Scale (Abidin, 1997); an additional question addressed parental self-efficacy, "In general, how well do you feel you are coping with the day-to-day demands of parenthood?" and another addressed social support, "Is there someone you can turn to for day-to-day emotional help with parenthood/raising children?" (Raphael et al., 2009, p. 218). One question addressed parental mental health "Would you say that in general [your mental and emotional health – if respondent is the mother/father] mental and emotional health is excellent, very good, good, fair, or poor?" Demographic information was also gathered. Child health care utilization was measured by asking the respondent how many times their child went to a hospital or ED in the past 12 months, how many times the child sought care for a sick visit (non-emergent), and how many times the child sought medical care for preventative reasons (e.g., well-child check).

A significant relationship was reported between high parenting stress and pediatric ED utilization (Raphael et al., 2009). Additionally, increased emotional support was associated to higher preventative care utilization, and parents reporting decreased social support had children with higher odds of sick visits to a primary care facility.

Although a national database was used to provide a large sample size, there were several limitations to this study. First, all information (including health care utilization) was based on self-report, with no way for researchers to verify the data. Second, it did not appear that the researchers proved that the participant was the parent/legal guardian/primary caretaker of the child being reported on. This might have influenced the accuracy of the reported data. Third, the questions used to measure the independent variables (e.g., parenting stress, parenting self-efficacy) were not validated and reliable measures, but instead single questions (in the case of parenting self-efficacy, social support, and mental health) or taken from a validated measure (parenting stress) possibly impacting the validity and reliability of the results.

In the seventh article (Rivara et al., 2007), researchers examined the role of mothers with a history of intimate partner violence (IPV) and child health care utilization. Telephone interviews were conducted on a random sample of women aged 18 to 64 in Group Health, a "large, integrated, health care delivery system in the United States" (Rivara et al., 2007, p. 1271).

IPV was measured by the Behavioral Risk Factor Surveillance System (Centers for Disease Control and Prevention, 2001) and the Women's Experience of Battering Scale (Smith, Earp, & DeVellis, 1995). Health care utilization was determined from Group Health automatic databases for an 11 year period. Final data analysis was completed on 834 women and their 1391 children; the sample was largely middle class, White non-Hispanic, and insured via employment (Rivara et al., 2007).

Approximately 45% of children had mothers who reported a history of IPV either before the child was born or after birth. Health care utilization and costs were higher for children of mothers with a history of IPV, and significantly higher for mental health services, primary care visits, and laboratory costs. Although the researchers indicated that a history of maternal IPV has an impact on child health utilization (Rivara et al., 2007), the researchers did not examine other issues that might further influence health care utilization might be associated with a history of IPV, such as anxiety, depression, stress, or social support.

Authors of the final article in this category (Sills et al., 2007) examined the association between parental depression and children's health care use. Participants were recruited through the Kaiser Permanente of Colorado (KPCO) membership system; all children up to 17 years of age enrolled in KPCO between 1997 and 2002 were identified. The person listed on the child's record as subscriber was considered to be the child's "parent." Parents were considered to have depression if there was at least one depression diagnosis code on their medical record – children of parents with a diagnosis of depression were considered "exposed." There were a total of 24,391 exposed and 45,274 unexposed children in the study; of the exposed children, 88.2% had one depressed parent, 11.7% had two, and 0.1% had three depressed parents (Sills et al., 2007). Child health care utilization was measured using count data from the children's KPCO use database, and five different types of use were gathered; well-child visits, sick visits to primary care, specialty clinic visits, ED visits, and inpatient hospitalizations.

Researchers indicated that exposed children had "higher rates of sick visits and ED visits in all ages" (Sills et al., 2007, p. e832). Exposed children over six years old had higher hospital rates than unexposed children, and exposed teenagers had a lower rate of well-child visits. Although the study did take into account paternal reports of depression in addition to maternal reports, the study only relied on diagnosis of depression (or similar mental health issues) as reported to the KPCO and not on depressive symptoms alone. Additionally, researchers considered diagnoses such as "Predominant disturbance of emotions," "Adjustment reaction, with mixed disturbance of emotions" and "Adjustment reaction, brief depressive" as a depression diagnoses; diagnoses may be experienced very differently from a more concrete depression diagnosis, such as "Major depression, recurrent episode" (Sills et al., 2007, p. e830). Additionally, little demographic information was reported, such as race/ethnicity of the parents, relationship status, or socioeconomic status. It is unclear if the results are generalizable to other populations, such as rural populations, as little information about the sample was provided.

Discussion

Although the literature search yielded several research articles that found relationships between parent characteristics such as depression (e.g., Flynn et al., 2004; Minkovitz et al., 2005; Sills et al., 2007), stress (e.g., Raphael et al., 2009) and parental responsiveness (e.g., Holland et al., 2012), no articles examined the influence of parental characteristics on child health care utilization in rural areas. As previously mentioned, there are unique needs in rural areas, such as limited access to health care, especially mental health care (Campbell, Kearns, & Patchin, 2006). Additionally, children in rural areas are more likely to have parents with high rates of psychosocial problems (Polaha et al., 2011). Taking into account the increased need for mental health care and higher rates of parental psychosocial issues, child health care utilization may look different in rural populations. In order to fully understand the needs of pediatric patients and their families, it is vital to have informed research that is generalizable to the rural population.

Second, it is necessary to employ a BPS lens in health care research involving children. Becoming aware of the biological, psychological, and social influences that impact children, their parents, and families will give researchers and clinicians a more inclusive picture of the needs of patients, and how the providers can attend to these needs (especially as they relate to health care utilization). For example, high health care utilization can be indicative of unmet needs within a family (e.g., parental distress, family conflict) (Janicke & Finney, 2003) and without a multi-systemic, BPS approach, the underlying concerns fueling health care utilization may be overlooked. Janicke and Finney explain,

> As primary care physicians take on a greater role as gatekeepers of the health care system, better understanding of the diverse factors that influence a parent's decision to seek physician assistance are critical to ensure that families are connected with the services best suited to address their concerns. (2003, p. 548)

Understanding the needs of patients and their families (particularly in rural areas) will allow for providers to address issues more accurately to aid in the prevention of health care overuse and/or underuse, minimizing overall costs and maximizing benefits.

Implications

The results of this literature review have led to many implications for future research. First, more research (explicitly identifying with a rural sample) is needed to address the specific and unique needs of parents and their children in these areas. Next, it may be beneficial for researchers to complete further investigations regarding the relational components that influence pediatric health care utilization (e.g., how the mother influences health care utilization) in rural populations. Finally, research is needed that examines the influence of parental BPS characteristics on children at all ages (e.g., infancy through teenage years).

REFERENCES

Abidin, R.R. (1997). Parenting stress index: a measure of the parent child system. In C. Zalaquett & R. Woods: *Evaluating Stress: A Book of Resources,* 277-291. Scarecrow Press, Inc: Lanham, MD.

Achenbach, T.M. (1991) *Manual for the Child Behavior Checklist/4-18 and 1991 Profile.* Burlington, VT: University of Vermont Department of Psychiatry.

American Academy of Pediatrics. (1992). Ad hoc task force on definition of the medical home: The medical home. *Pediatrics, 90,* 774-778.

Blumberg, S., Olson, L., Srinath, K. & Giambo, P. (2005). Design and operation of the national survey of children's health. *Vital and Health Statistics. Ser. 1, Programs and Collection Procedures, 43,* 1-124.

Campbell, C.D., Kearns, L.A., & Patchin, S. (2006). Psychological needs and resources as perceived by rural and urban psychologists. *Professional Psychology: Research and Practice, 37,* 45-50.

Centers for Disease Control and Prevention. (2001). *Behavioral Risk Factor Surveillance System Survey Questionnaire.* Atlanta, GA: Centers for Disease Control and Prevention.

Cohen, S.B. (2000). Sample design of the 1997 Medical Expenditure Panel Survey Household Component. *MEPS Methodology Report, 11.*

Derogatis, L.R. (1993). *Brief Symptom Inventory (BSI): Administration, scoring, and procedures manual.* 3rd ed. Minneapolis: National Computer Systems.

Dumka, L., Stoerzinger, H., & Jackson, K., & Roosa, M. (1996). Examination of the cross-culture and language equivalence of the Parenting Self-Agency Measure. *Family Relations, 45,* 216-222.

Eisen, M., Ware Jr, J. E., Donald, C. A., & Brook, R. H. (1979). Measuring components of children's health status. *Medical care, 17*(9), 902-921.

Engel, G. L. (1977). The need for a new medical model: a challenge for biomedicine. *Science, 196,* 129–136.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry, 137,* 535-544.

Enkin, M.W., & Jadad, A.R. (1998). Using anecdotal information in evidence-based health care: Heresy or necessity? *Annals of Oncology, 9,* 963-966.

Ernst, P., & Cormier, Y. (2000). Relative scarcity of asthma and atopy among rural adolescents raised on a farm. *American Journal of Respiratory Critical Care Medicine, 161,* 1563-1566.

Farmer, J.E., Clark, M.J., Sherman, A., Marien, W.E., &Selva, J.T. (2005). Comprehensive primary care for children with special health care needs in rural areas. *Pediatrics, 116,* 649-656.

Flynn, H.A., Cain, S.A., O'Mahen, H.A., Davis, M.M. (2006). Detection of maternal alcohol use problems in the pediatric emergency department. *Alcoholism: Clinical and Experimental Research, 30,* 1160 – 1164.

Flynn, H.A., Davis, M., Marcus, S.M., Cunningham, R., & Blow, F.C. (2004). Rates of maternal depression in pediatric emergency department and relationship to child service utilization. *General Hospital Psychiatry, 26,* 316-322.

Gorman, B.K., & Braverman, J. (2008). Family structure differences in health care utilization among U.S. children. *Social Science & Medicine, 67,*1766-1775.

Guyer, B., Hughart, N., Strobino, D., Jones, A., Scharfstein, D. (2000). Assessing the impact of pediatric-based developmental service on infants, families, and clinicians: Challenges to evaluating the Healthy Steps program. *Pediatrics, 105,* e33-e43.

Holland, M.L., Yoo, B.K., Kitzman, H., Chaudron, L., Szilagyi, P.G., Temkin-Greener, H. (20120). Mother-child interactions and the associations with child healthcare utilization in low-income urban families. *Maternal and Child Health Journal, 16,* 83-91.

Hortz, B., Stevens, E., Holden, B., &Petosa, R.L. (2009). Rates of physical activity among Appalachian adolescents in Ohio. *The Journal of Rural Health, 25,* 58-61.

Hughes, S.C., & Wingard, D.L. (2008). Parental beliefs and children's receipt of preventative care: Another piece of the puzzle? *Health Services Research, 43,* 287-299.

Husaini, B.A., Neff, J.A., McCorkel, J. (1980). Depression in rural communities: Validating the CES-D scale. *Journal of Community Psychology, 8,* 20-27.

Janicke, D. M., & Finney, J. W. (2003). Children's primary health care services: Social-cognitive factors related to utilization. *Journal of Pediatric Psychology, 28,* 547-558.

Janicke, D.M., Finney, J.W., & Riley, A.W. (2001). Children's health care use: A prospective investigation of factors related to care-seeking. *Medical Care, 39,* 990-1001.

Laraque, D., & Sia, C.C.J. (2010). Health care reform and the opportunity to implement a family-centered medical home for children. *Journal of the American Medical Association, 303,* 2407-2408.

Loiselle, K.A., Lee, J.L., Gilleland, J., Campbell, R., Simpson, P., Johnson, G., Dooley, K., & Blount, R. L. (2012). Factors associated with healthcare utilization among children with noncardiac chest pain and innocent heart murmurs. *Journal of Pediatric Psychology, 37,* 817-825.

Long, W.E., Bauchner, H., Sege, R.D., Cabral, H.J., & Garg, A. (2012). The value of the medical home for children without special health care needs. *Pediatrics, 129,* 87-98.

Minkovitz, C.S., Strobino, D., Scharfstein, D., Hou, W., Miller, T., Mistry, K.B., & Swartz, K. (2005). Maternal depressive symptoms and children's receipt of health care in the first 3 years of life. *Pediatrics, 115,* 306-314.

Moos, R. H., & Moos, B.S. (1981). *Family Environment Scale manual.* Palo Alto: Consulting Psychologists Press.

Moran, T.E., & O'Hara, M.W. (2006). Maternal psychosocial predictors of pediatric health care use: Use of the common sense model of health and illness behaviors to extend beyond the usual suspects. *Clinical Effectiveness in Nursing, 952,* 171-180.

Olfson, M., Marcus, S.C., Druss, B., Pincus, H.A., & Weissman, M.M. (2003). Parental depression, child mental health problems, and health care utilization. *Medical Care, 41,* 716-721.

Orr, S.T., James, S.A., & Charney, E. (1989). A social environment inventory for the pediatric office. *Journal of Developmental and Behavioral Pediatrics, 10,* 287-291.

Polaha, J., Dalton, W.T., & Allen, S. (2011). The prevalence of emotional and behavioral problems in pediatric primary care serving rural children. *Journal of Pediatric Psychology, 36,* 652-660.

Radloff, L.S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measures, 1,* 385-401.

Raphael, J.L., Zhang, Y., Liu, H., & Giardino, A.P. (2009). Parenting stress in US families: Implications for pediatric healthcare utilization. *Child: Care, Health and Development, 36,* 216-224.

Riley, A.W., Finney, J.W., Mellits, E.D., Starfield, B., Kidwell, S., Quaskey, S., Cataldo, M.F., Filipp, L., & Shematek, J.P. (1993). Determinants of children's health care use: An investigation of psychosocial factors. *Medical Care, 31,* 767-783.

Rivara, F.P., Anderson, M.L., Fishman, P., Bonomi, A.E., Reid, R.J., Carrell, D., & Thompson, R.S. (2007). Intimate partner violence and health care costs and utilization for children living in the home. *Pediatrics, 120,* 1270-1277.

Romaire, M.A., Bell, J.F., & Grossman, D.C. (2012). Health care use and expenditure associated with access to the medical home for children and youth. *Medical Care, 50,* 262-269.

Rost, K., Burnam, M., Smith, R. Development of screeners for depressive disorders and substance disorder history. *Medical Care, 31*, 189-200.

Russel, M. (1994). New assessment tools for risk drinking during pregnancy; T-ACE, TWEAK and others. *Alcohol Health and Research World, 18*, 55-61.

Sarason, I.G., Sarason, B.R., Shearin, E.N., & Pierce, G.R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of Social and Personal Relationships, 4,* 498-507.

Sills, M.R., Shetterly, S., Xu, Stanley, Magid, D., & Kempe, A. (2007). Association between parental depression and children's health care use. *Pediatrics, 119,* e829-e836.

Smith, P.H., Earp, J.A., DeVellis, R. (1995). Measuring battering: Development of the Women's Experience with Battering (WEB) Scale. *Women's Health, 1,* 273-288.

von Bertalanffy, L. (1968). *General Systems Theory*. New York: Braziller.

Ware, J.E., & Sherbourne, C.D. (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care, 30,* 473-483.

Table 1.

Article Summaries by Theme

Author(s)/Year	**Parent(s) of Focus**	**Parent/Caretaker Characteristics**	**Rural Population**	**Setting (Primary Care/Emergency)**
Preventative Care Utilization				
Gorman & Braverman, 2008	Both	Family Structure (e.g., one vs. two parent households)	Unclear – Data from “US National Health Interview Survey”	Primary Care
Hughes & Wingard, 2008	Both	Parental beliefs, educational level, regular source of care (e.g., medical home)	No	Primary Care
Problem-Based Care Utilization				
Flynn et al., 2006	Mother	Maternal alcohol use	No	Emergency Department
Flynn et al., 2004	Mother	Maternal depression	No	Emergency Department
Preventative and Problem-Based Care Utilization				
Holland et al., 2012	Mother	Mother responsiveness	No	Primary Care and Emergency Department

Janicke & Finney, 2003	Both	Parental social-cognitive factors (e.g., parenting self-efficacy, stress, distress)	No	Primary Care
Janicke & Finney, 2001	Mother	Maternal emotional functioning (e.g., social support, mental health, family life events)	No	Unclear – All HMO Visits
Minkovitz et al., 2005	Mother	Maternal depression	Unclear – "Economically and ethnically diverse population"	Primary Care and Emergency Department
Olfson et al., 2003	Both	Parental depression	Unclear – Data collected from "national probability sample"	Unclear – All medical expenditures were recorded for a one year period
Raphael et al., 2009	Both	Parenting stress	Unclear – Data from "National Survey of Children's Health"	Primary Care and Emergency Department/Hospitalization
Rivara et al., 2007	Mother	Maternal history of IPV	Unclear – Data from "Group Health, a large, integrated, health care delivery	Unclear – All medical expenditures within a health care delivery system (Group Health) were reviewed

			system in the United States”	
Sills et al., 2007	Both	Parental depression	No	Primary Care, Emergency Department, Specialty Clinics, Inpatient

CHAPTER 4: METHODOLOGY: PARENTAL INFLUENCES ON CHILD HEALTH CARE UTILIZATION IN A RURAL POPULATION

Numerous factors such as parental stress (Janicke & Finney, 2003), parental psychopathology (Sills, Shetterly, Xu, Magid, & Kempe, 2007), parenting self-efficacy (Moran & O'Hara, 2006) and maternal depression (Flynn, Davis, Marcus, Cunningham & Blow, 2004) have been shown in the literature to be related to increased child health care utilization. For example, children with depressed parents have a higher possibility of mental health concerns and increased health care utilization for mental health issues (Olfson, Marcus, Druss, Pincus, & Weissman, 2003). Children with anxious parents may be more likely to have somatic symptoms (i.e., pain) and psychological distress (Loiselle et al., 2012). As compared to their non-rural counterparts, rural children experience additional health issues and disparities as compared to and have parents with high rates of psychosocial problems (Polaha, Dalton, & Allen, 2011).

Project Aims and Rationale

This study was completed to explore the relationship between parent/caregiver characteristics and child health care utilization in a rural population. This research is necessary given recent indications that children and adults in rural areas have unique needs and challenges, along with increased difficulties in accessing health care (Farmer, Clark, Sherman, Marien, & Selva, 2005). Furthermore, rural populations have been underrepresented in the research. A descriptive cross-sectional study was conducted to explore the following research question: Is there a relationship between parent/guardian biopsychosocial health characteristics (anxiety, depression, distress, parenting self-efficacy, perceived social support and mental and physical quality of life) and the frequency of child health care utilization?

Study Design

Surveys were administered during child health visits to a rural community health clinic along with retrospective count data. The variables included in the proposed study are parental self-efficacy as measured by the Parent Self-Agency Measure (Dumka et al., 1996) anxiety and depression as measured by the Patient Health Questionnaire for Anxiety and Depression (PHQ-4; Kroenke, Spitzer, Williams, & Lowe, 2009), perceived social support using the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988), parent health-related quality of life using the Short-Form 12, version 2 (SF-12v2; Ware, Kosinksi, & Keller, 2006), parent and child emergency room/urgent care utilization via parent self-report, and child health care utilization as indicated by the clinic electronic medical record (EMR). Demographic variables included caregiver relationship to patient (e.g., mother, father, legal guardian), caregiver age and ethnicity, child age and ethnicity, total number of children in household, relationship status, highest level of education, annual income, current employment, and hours per week spent working outside of the home. See Appendix A for complete survey. The hypotheses initially proposed for this study are as follows:

1. Increased parent/guardian anxiety, depression, and distress and lower levels of parenting self-efficacy, perceived social support, and quality of life will be associated with increased child health care utilization, while decreased parent guardian anxiety, depression, and distress and higher levels of parenting self-efficacy, perceived social support, and quality of life will be associated with decreased child health care utilization.

2. Poorer parent/guardian physical health will be associated with increased child health care utilization, while increased parent/guardian physical health will be correlated with decreased child health care utilization.

Approval was gained from the East Carolina University and Medical Center Institutional Review Board (IRB) prior to data collection.

Setting

Data were collected from Pamlico Community Health Center, part of Greene County Health Care (GCHC), a Federally Qualified Health Center (FQHC) in rural eastern North Carolina. Started in 1972, GCHC has grown to seven locations in three counties, and includes primary medical care clinics, dental care sites, and a school-based health clinic (Macrae, 2011), and offers patients reduced-cost health care by utilizing a sliding fee scale based on patients' household income. Private insurance is billed for patients who have this resource. In November 2011, Pamlico Community Health Center (formerly Pamlico Pediatrics) officially became part of GCHC and switched from a pediatric only center to one that also included adult patient care. At the time of data collection, there was one pediatrician on staff (seeing only pediatric patients), and two physician assistants (seeing both pediatric and adult patients).

Participants

The participants included primary caregivers of children ages 2 to 17. Participants were required to be the parent, or legal guardian of the child (i.e., have legal responsibility for the child), speak and read English, and be able to read at approximately an eighth grade reading level. Exclusion criteria included: the adult accompanying the child to the health visit is someone other than the child's parent, step-parent, or legal guardian; or an inability to complete the clinical questionnaire because of mental incapacitation.

Independent Variable Measures

Independent variables include basic demographic information (e.g., ethnicity, relationship status, level of education), parental self-agency, anxiety and depression, quality of life, and social support. The following measures were used to gather the data on these variables:

Demographic information.

Basic demographic information from the parent/caregiver about him or her and his or her child was gathered. This included the participant’s relationship to the pediatric patient (e.g. mother), the participant’s age and ethnicity, the child’s age and ethnicity, the participant’s total number of children, relationship status, highest level of education, annual income, employment status and profession, along with caregiver’s medical and mental health diagnoses, and any medications that the caregiver is currently taking.

Parental self-agency.

The Parent Self-Agency Measure (PSAM; Dumka et al., 1996) was used to measure parents’ level of confidence in their ability to be successful parents. It has five questions with answers on a seven-point Likert-type scale. The range of answers are scaled from 1 (rarely) to 7 (always). Cronbach’s alpha was reported to be in the range of .68 to .70 (Dumka et al., 1996). A more recent study involving the measure reported an alpha level of .81 (Coleman & Karraker, 2000). A sample item includes, “I know I am doing a good job as a mother/father” (Dumka et al., 1996, p. 219). Higher scores on the measure indicate more positive self-efficacy in parents (Coleman & Karraker, 2000; Dumka et al., 1996).

This PSAM was normed on English-speaking, middle-income White non-Hispanic mothers (N=90) and on Spanish speaking low-income Mexican immigrant mothers (N=94), with Cronbach’s alpha ranging from .68 to .70 (Dumka et al., 1996). In a sample of primarily White non-Hispanic females (N=145, 5% non-White non-Hispanic), Cronbach's alpha was .81 (Coleman & Karraker, 2000). This measure has not been normed on a rural population.

Anxiety and depression.

The Patient Health Questionnaire for Depression and Anxiety (PHQ-4) was used as a brief measure for anxiety and depression (Kroenke et al., 2009), and is a composite of two ultra-brief screening tools that have been developed and validated (Lowe et al., 2010), the GAD-2 (Kroenke, Spitzer, Williams, Monahan, & Lowe, 2007) and the PHQ-2 (Kroenke, Spitzer, & Williams, 2003). The PHQ-2 "is the most validated 2-item screener for depression" (Lowe et al., 2010, p. 87). Both the GAD-2 and the PHQ-2 have been normed for use with a variety of racial and ethnic groups (Chunyu, Friedman, Conwell, & Fiscella, 2007; Gjerdingen, Crow, McGovern, Miner, & Center, 2009; Lowe et al., 2010; Monahan et al., 2007). A variation of this measure, the PHQ-9, has been used with rural populations (e.g., Bergus et al., 2005). The PHQ-4 was initially explored on adults (M=47.2 years, *SD* = 15.4 years), who were primarily White non-Hispanic (81%), with a smaller representation of African American (8%) and Hispanic (8%) participants (Kroenke et al., 2009). Sixty two percent of participants had some college education. Anxiety is considered a score greater than 3 on the anxiety subscale, and depression is considered for patients who receive a score greater than 3 on the depression subscale, and Cronbach's alpha was .85. Increased scores on the PHQ-4 were strongly associated with participant health care use, disability days, and functional impairment (Kroenke et al., 2009). A sample question is, "Over the last two weeks, how often have you been bothered by feeling nervous, anxious, or on edge?" with the options of "not at all, several days, more than half the days, or nearly every day" (Kroenke et al., 2009, p. 615).

Distress.

The Distress Thermometer (DT) was used to measure emotional distress (Roth et al., 1998). This is a single-item self-report measure that is an 11-point scale with one end of the scale labeled as “No distress” and 10 as “Extreme distress” (Roth et al., 1998). Participants circle the number that best describes their level of distress in the past seven days. A cut-off score of 4 indicates distress and the measure is reported to have acceptable reliability (.70) and validity (.70) (Ransom, Jacobson & Booth-Jones, 2006). The DT is sometimes used in conjunction with the Patient Problem List (National Comprehensive Cancer Network, 2007), and will also be used in this study. The Patient Problem List has five categories: practical problems, family problems, emotional problems, spiritual/religious concerns, and physical problems, and participants indicate if they have experienced any of the problems in the past week by marking yes or no (National Comprehensive Cancer Network, 2007). The DT has been used with rural populations (e.g., Graves et al., 2007).

Health related quality of life.

The SF-12v2 was used to measure eight domains of health-related quality of life: physical functioning, role limitations related to physical health, bodily pain, general health, vitality, social functioning, role limitations related to emotional problems, and mental health (Ware et al., 1996). These items yield the Physical Component Summary (PCS) and the Mental Component Summary (MCS). This is a 12-item questionnaire with answers provided in a Likert-type scale. A sample question is, “In general, would you say your health is: 1) Excellent, 2) Very Good, 3) Good, 4) Fair, or 5) Poor” (Ware et al., 1996). Internal reliability has been estimated at .91 for the PCS measure and .87 for the MCS measure (Ware et al., 2010), and was initially normed on the general US population and adults with chronic illness (Ware et al., 1996). The measure has also shown high validity and reliability when used with low-income African Americans in a community-based sample for the PCS and MCS components, with alpha levels of .80 and .78 respectively (Larson, Schlundt, Patel, Hargreaves & Beard, 2008). In a homeless sample, Cronbach's alpha = .82 for physical health and .79 for mental health (Larson, 2009). The SF-12v2 has also been used with rural populations (e.g., Tommis et al., 2007).

Cut-off scores for the measure are dependent on the participant's age range; mean scores are provided for ten-year age groups. Scores higher than the mean in a particular age group indicate a better health status than most others in the age range, and lower scores indicate poor health (Ware et al., 1996).

Perceived social support.

To measure social support, the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) was used. There are a total of 12 statements on the MSPSS, with answers on a seven-point Likert-type scale. The answers are scaled from 1 (very strongly disagree) to 7 (very strongly agree). A sample question is, "I get the emotional help and support I need from my family" (Zimet et al., 1988, p. 35). Higher scores indicate higher social support. There are three subscales of the MSPSS; significant other, family and friends. The reliability of the total scale was reported as .85, whereas Cronbach's alpha for the significant other, family, and friends subscales were .72, .85, and .75, respectively (Zimet et al., 1988, p. 36).

This scale was originally developed on 275 college undergraduates at Duke University (Zimet et al., 1988), though has been replicated in multiple studies with different samples (e.g., psychiatric outpatients, urban college students with diverse ethnic backgrounds, older adults) and demonstrated high internal consistency (Canty-Mitchell &Zimet, 2000; Cecil, Stanley, Carrion, & Swann, 1995; Clara, Cox, Enns, Murray, & Torgrude, 2003; Zimet, Powell, Farley, Werkman, & Berkoff, 1990). Regarding diverse populations specifically, this scale has been used with African Americans (Canty-Mitchell & Zimet, 2000) and Mexican Americans (Edwards, 2004; Edwards & Lopez, 2006) with high internal reliability for the total and subscale scores, ranging from .89 to .93 (Canty-Mitchell & Zimet, 2000). The scale has also been used with rural populations (e.g., Yoon & Lee, 2006).

Dependent Variable Measures

The child's health care utilization served as the dependent variable in this study. This information was gathered via direct chart review by the researchers. The researchers collected the total number of visits and phone calls about the child, made to the clinic in the 24 months prior to the questionnaire distribution. Researchers differentiated between well-check visits and sick visits. Integrated care visits (i.e., brief consultations with Medical Family Therapists assessing for psychosocial concerns and health goals simultaneous with medical visit) and traditional family therapy appointments were also collected. The caregivers (parents/guardians) also provided an estimate on the questionnaire as to how many visits the caregiver and the child made to an after-hours urgent care/emergent care facility in the past 24 months.

Data Collection and Procedures

The participants were recruited by the first author at a health center that specializes in pediatrics. Participants had the option of entering their contact information in a raffle for a chance to win one of three $25 gas cards, drawn at the conclusion of data collection. Upon returning their survey to the front desk staff, each participant was given a form to fill out with their name and contact information to be entered into the drawing, if the participant desired. These raffle forms were kept in a locked drop box at the clinic. At the conclusion of data collection, the first author randomly drew three names from the drop box to determine the winners of the raffle and notified the recipients of the gift card and either mailed it to his or her home address upon consent or left it for him or her to pick up at the clinic.

The parents/guardians of pediatric patients were provided with a questionnaire packet to fill out while waiting for the appointment with the medical provider if they agreed to participate. This packet contained an informed consent form that was filled out and signed by the caregiver before completing the survey. Children over the age of seven (Kimberly, Hoehn, Feudtner, Nelson & Schreiner, 2006; National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978) were given a separate assent form written in age-adjusted language (Kimberly et al., 2006). Children under the age of seven were read an assent form and asked for verbal assent, and parents of children aged two to four gave consent on the child’s behalf; assent was not collected. The questionnaire included several measures, including the Parent Self-Agency Measure (Dumka et al., 1996); the Patient Health Questionnaire for Depression and Anxiety (Kroenke et al., 2009); the Distress Thermometer (Roth et al., 1998) and accompanying Problem List (National Comprehensive Care Network, 2007), the SF-12v2 (Ware et al., 1996) and the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), a demographic survey, a question asking for a self-report estimate of how many visits the patient and caregiver has had to an after-hours or emergent care clinic in the past 24 months, and questions asking for any current medical or mental health diagnoses and any medications the caregiver was currently taking. Participants were also asked if they have sought mental health support in the past year (e.g., with a counselor, family therapist, psychologist).

Patient health care utilization was measured via direct chart review. In order to correlate each patient’s health care utilization with the parent’s response, the surveys were assigned a number that corresponds with the patient’s medical record number. Only the first author had access to the coding sheet that connects the survey codes with the patients' medical record numbers in order to protect the confidentiality of the patient and his or her parent. This coding sheet was stored independent of the study surveys on a password protected departmental Pirate Drive, with Dr. Hodgson as the responsible party for the Pirate Drive.

The participants were given an envelope to seal their survey in upon completion, and were instructed at the bottom of the survey to return it to the front desk staff upon checkout. The front desk staff then placed the sealed envelopes into a locked drop box that only the first author had access to. Once the surveys were gathered, they were kept in a locked briefcase only accessible by the first author, and the briefcase was stored in a locked cabinet in the clinic. The data were transferred for analysis to a datasheet on the statistical software JMP. The data files were stored on a departmental folder on the ECU Pirate Drive and were password protected, only accessible by the researchers. Following the conclusion of the study, all materials (i.e., surveys) were moved to a locked filing cabinet in Dr. Hodgson's office to be stored for six years, the length of retention as required by the IRB.

Statistical Analyses

Data gathered from the surveys were paired with utilization counts from the electronic medical records used for the analyses. Prior to modeling the data, descriptive univariate statistical analyses investigating central tendency (e.g., mean) and dispersion (e.g., standard deviation) were completed. Bivariate statistical analyses (e.g., Spearman correlations) were also performed along with visual summaries (e.g., histogram) to assess for unequal variances across groups. After running initial univariate and bivariate statistical analyses, many of the psychosocial measures were found to be highly correlated (including the PHQ-4, DT, Problem List, PSAM, and MSPSS). Thus, the MCS subscale of the SF-12v2 was used as the psychosocial measure, and the PCS subscale of the SF-12v2 was used to measure physical health. As such, hypotheses were slightly altered from their original form.

To investigate the first hypothesis, “Decreased parent/guardian mental health quality of life will be associated with increased acute child health care utilization,” child health care utilization counts served as the dependent variable as reported by the EMR, while mental health quality of life using the MCS subscale of the SF-12v2 (Ware et al., 2006) and demographics served as the independent variables in the analysis.

To explore the second hypothesis, “Decreased parent/guardian mental health quality of life will be associated with decreased non-acute child health care utilization,” child health care utilization counts served as the dependent variable as reported by the EMR, while mental health quality of life using the MCS subscale of the SF-12v2 (Ware et al., 2006) and demographics served as the independent variables in the analysis.

To test the third hypothesis, “Poorer parent/guardian physical health will be correlated with increased acute child health care utilization,” child health care utilization counts from the EMR served as the dependent variable, and quality of life – PCS component via the SF-12v2 (Ware et al., 2006) along with demographics served as the independent variables in the analysis.

To explore the final hypothesis, “Poorer parent/guardian physical health will be correlated with decreased non-acute child health care utilization” child health care utilization counts from the EMR served as the dependent variable, and quality of life – PCS component via the SF-12v2 (Ware et al., 2006) and demographics served as the independent variables in the analysis.

Summary

The aims of this project were to gather data on various parent/guardian biopsychosocial characteristics (e.g., anxiety, depression, social support, physical health quality of life) along with data from child health care utilization in order to understand more about parental influence on child health care utilization in rural populations. The lack of research available on parental influence on child health care utilization in rural populations served as the inspiration for this project. The findings are meant to provide insight on the needs of children and their parents in rural health care settings to influence appropriate utilization.

REFERENCES

Bergus, G.R., Hartz, A.J., Noyes, R., Ward, M.M., James, P.A., Vaughn, T., Kelley, P.L., Sinift, S.D., Bentler, S., & Tilman, E. (2005). The limited effect of screening for depressive symptoms with the PHQ-9 in rural family practices. *The Journal of Rural Health, 21,* 303-309.

Canty-Mitchell, J., & Zimet, G. D. (2000).Psychometric properties of the Multidimensional Scale of Perceived Social Support in urban adolescents. *American Journal of Community Psychology, 28,* 391-400.

Cecil, H., Stanley, M. A., Carrion, P. G., & Swann, A. (1995).Psychometric properties of the MSPSS and NOS in psychiatric outpatients. *Journal of Clinical Psychology*, *51*, 593-602.

Chunyu, L., Friedman, B., Conwell, Y., & Fiscella, K. (2007). Validity of the Patient Health Questionnaire 2 (PHQ-2) in identifying major depression in older people. *Journal of the American Geriatrics Society, 55,* 596-602.

Coleman, P.K., & Karraker, K.H. (2000). Parenting self-efficacy among mothers of school-age children: Conceptualization, measurement, and correlates. *Family Relations, 49,* 13-24.

Clara, I. P., Cox, B. J., Enns, M. W., Murray, L. T., & Torgrude, L. J. (2003).Confirmatory factor analysis of the Multidimensional Scale of Perceived Social Support in clinically distressed and student samples. *Journal of Personality Assessment*, *81,* 265-270.

Dumka, L.E., Stoerzinger, H.D., Jackson, K. M., & Roosa, M.W. (1996). Examination of the cross-cultural and cross-language equivalence of the Parenting Self-Agency Measure. *Family Relations, 45,* 216-222.

Edwards, L. M. (2004). Measuring perceived social support in Mexican American youth: Psychometric properties of the Multidimensional Scale of Perceived Social Support. *Hispanic Journal of Behavioral Sciences, 26*, 187-194.

Edwards, L. M., & Lopez, (2006). Perceived family support, acculturation, and life satisfaction in Mexican American youth: A mixed-methods exploration. *Journal of Counseling Psychology, 53,* 279-287.

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196,* 129-136.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry, 137*, 535-544.

Farmer, J.E., Clark, M.J., Sherman, A., Marien, W.E., & Selva, T.J. (2005). Comprehensive primary care for children with special health care needs in rural areas. *Pediatrics, 116,* 649-656.

Flynn, H.A., Davis, M., Marcus, S.M., Cunningham, R., & Blow, F.C. (2004). Rates of maternal depression in pediatric emergency department and relationship to child service utilization. *General Hospital Psychiatry, 26*, 316-322.

Gjerdingen, D., Crow, S., McGovern, P., Miner, M., & Center, B. (2009). Postpartum depression screening at well-child visits: Validity of a 2-question screen and the PHQ-9. *Annals of Family Medicine, 7*, 63-70.

Graves, K.D., Arnold, S.M., Love, C.L., Kirsh, K.L., Moore, P.G., & Passik, S.D. (2007). Distress screening in a multidisciplinary lung cancer clinic: Prevalence and predictors of clinically significant distress. *Lung Cancer, 55*, 215-224.

Jacobsen, P.B., Donovan, K.A., Trask, P.C., Fleishman, S.B., Zabora, J., Baker, F., Holland, J.C. (2005). Screening for psychological distress in ambulatory cancer patients: A multicenter evaluation of the distress thermometer. *Cancer, 103,* 1494-1502.

Janicke, D. M., & Finney, J. W. (2003). Children’s primary health care services: Social-cognitive factors related to utilization. *Journal of Pediatric Psychology, 28,* 547-558.

Kimberly, M.B., Hoehn, K.S., Feudtner, C., Nelson, R.M., & Schreiner, M. (2006). Variation in standards of research compensation and child assent practices: A comparison of 69 institutional review board-approved informed permission and assent forms for 3 multicenter pediatric clinical trials. *Pediatrics, 117,* 1706-1711.

Kroenke, K., Spitzer, R.L., & Williams, J.B. (2003). The Patient Health Questionnaire-2: Validity of a two-item depression screener. *Medical Care, 41,* 1284-1292.

Kroenke, K., Spitzer, R.L., Williams, J.B.W., & Lowe, B. (2009). An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics, 50,* 613-621.

Kroenke, K., Spitzer, R.L., Williams, J.B., Monahan, P.O., & Lowe, B. (2007) Anxiety disorders in primary care: Prevalence, impairment, comorbidity and detection. *Annals of Internal Medicine, 146,* 317-325.

Larson, C.O. (2009). Use of the SF-12 instrument for measuring the health of homeless persons. *Health Services Research, 37,* 733-750.

Larson, C.O., Schlundt, D., Patel, K., Hargreaves, M., & Beard, K. (2008). Validity of the SF-12 for use in a low-income African American community-based research initiative (REACH 2010). *Preventing Chronic Disease, 5,* 1-14.

Loiselle, K.A., Lee, J.L., Gilleland, J., Campbell, R., Simpson, P., Johnson, G., Dooley, K., & Blount, R. L. (2012). Factors associated with health care utilization among children with noncardiac chest pain and innocent heart murmurs. *Journal of Pediatric Psychology, 37,* 817-825.

Lowe, B., Wahl, I., Rose, M., Spitzer, C., Glaesmer, H., Wingenfeld, K., Schneider, A., & Brahler, E. (2010). A 4-item measure of depression and anxiety: Validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population. *Journal of Affective Disorders, 122,* 86-95.

Macrae, J. (2011). Greene county health care. Retrieved August 25, 2012, from www.greenecountyhealthcare.com.

Monahan, P.O., Shacham, E., Reece, M., Kroenke, K., Ong'or, W.O., Omollo, O., Yebei, V.N., & Ojwang, C. (2008). Validity/reliability of PHQ-9 and PHQ-2 depression scales among adults living with HIV/AIDS in western Kenya. *Journal of General Internal Medicine, 24,* 189-197.

Moran, T.E., & O'Hara, M.W. (2006). Maternal psychosocial predictors of pediatric health care use: Use of the common sense model of health and illness behaviors to extend beyond the usual suspects. *Clinical Effectiveness in Nursing, 952,* 171-180.

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1978) *The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.* Washington, DC: US Government Print Office.

National Comprehensive Cancer Network. (2007). *Clinical practice guidelines in oncology: Distress management (v.1.2008).*Retrieved August 25, 2012, from http://www.nccn.org/professionals/physician_gls/PDF/distress.pdf.

Olfson, M., Marcus, S.C., Druss, B., Pincus, H.A., & Weissman, M.M. (2003). Parental depression, child mental health problems, and health care utilization. *Medical Care, 41*, 716-721.

Polaha, J., Dalton, W.T., & Allen, S. (2011). The prevalence of emotional and behavioral problems in pediatric primary care serving rural children. *Journal of Pediatric Psychology, 36,* 652-660.

Ransom, S., Jacobsen, P.B., & Booth-Jones, M. (2006). Validation of the distress thermometer with bone marrow transplant patients. *Psychooncology, 15,* 604-612.

Raphael, J.L., Zhang, Y., Liu, H., & Giardino, A.P. (2009). Parenting stress in US families: Implications for pediatric healthcare utilization. *Child: Care, Health and Development, 36,* 216-224.

Roth, A.J., Kornblith, A.B., Batel-Copel, L., Peabody, E., Scher, H.I., & Holland, J.C. (1998). Rapid screening for psychologic distress in men with prostate carcinoma: A pilot study. *Cancer, 82,* 1904-1908.

Sills, M.R., Shetterly, S., Xu, Stanley, Magid, D., & Kempe, A. (2007). Association between parental depression and children’s health care use. *Pediatrics, 119,* e829-e836.

Tommis, Y., Seddon, D., Woods, B., Robinson, C.A., Reeves, C., & Russel, I. (2007). Rural-urban differences in the effects on mental health well-being of caring for people with stroke or dementia. *Aging and Mental Health, 11,* 743-750.

Trask, P.C., Paterson, A., Riba, M., Brines, B., Griffith, K., Parker, P., Weick, J., Steele, P., Kyro, K., & Ferrara, J. (2002). Assessment of psychological distress in prospective bone marrow transplant patients. *Bone Marrow Transplant, 29,* 917-925.

Ware, J.E., Kosinski, M., Gandek, B., Sundaram, M., Bjorner, J.B., Turner-Bowker, D.M., & Maruish, M.E. (2010). *User's manual for the SF-12v2 Health Survey* (2ndед.). Lincoln, RI: QualityMetric Incorporated.

Ware, J.E., Kosinski, M., & Keller, S.D. (1996). A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care, 34,* 220-233.

Yoon, D.P., & Lee, E.K.O. (2006). The impact of religiousness, spirituality, and social support on psychological well-being among older adults in rural areas. *Journal of Gerontological Social Work, 48,* 281-298.

Zimet, G.D., Dahlem, N.W., Zimet, S.G. & Farley, G.K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52,* 30-41.

Zimet, G. D., Powell, S. S., Farley, G. K., Werkman, S., & Berkoff, K. A. (1990).Psychometric Characteristics of the Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 55,* 610-618.

CHAPTER FIVE: PARENTAL INFLUENCES ON CHILD HEALTH CARE UTILIZATION IN A RURAL POPULATION

In this era of health care reform, maximizing patient health and minimizing cost is of great importance to policy makers, medical providers, patients, families, and other stakeholders (Romaire, Bell, & Grossman, 2012). Traditional models of health care that fragment care systems (e.g., medical and psychosocial) are not leading to gains in health care quality or outcomes. Integrating systems, however, can lead to improved quality, efficiency, and cost-effectiveness (Laraque & Sia, 2010). An example of an integrated model of care is the medical home, endorsed by the American Academy of Pediatrics (1992; Laraque & Sia, 2010). The medical home is defined as "access to family-centered, community-based, coordinated care directed or delivered by a primary care physician offering comprehensive, continuous, culturally effective, and compassionate care" (Laraque & Sia, 2010, p. 2407). For children, the medical home has been associated with increased health-promoting behaviors, better parental assessment of health, and improved patterns of health care utilization (e.g., decreased odds of having an outpatient sick visit and having an emergency department sick visit) (Long, Bauchner, Sege, Cabral & Garg, 2012).

Whereas involvement in a medical home has been found to be one facet of improving health care utilization (Long et al., 2012), researchers reported a variety of influences on child health care utilization such as child health status (Janicke & Finney, 2003), child psychosocial concerns (Janicke & Finney, 2003), maternal use of health care (Janicke, Finney, & Riley, 2001), and family issues, such as parental psychosocial stress (Moran & O'Hara, 2006). In spite of the available literature, researchers have not yet fully explored the different systemic components that influence health care utilization in order to minimize unnecessary spending and maximize health benefits.

Systemic Influences on Child Health

When addressing pediatric physical or psychosocial concerns, it is generally only the child who is the focus of treatment (Olfson, Marcus, Druss, Pincus, & Weissman, 2003). However, there is evidence that these physical and psychosocial issues do not always occur in isolation of the child and may be influenced by other systemic issues. For example, children with depressed parents have a higher possibility of mental health concerns and increased health care utilization for mental health issues (Olfson et al., 2003). Children with anxious parents may be more likely to have somatic symptoms (i.e., pain) and psychological distress (Loiselle et al., 2012). In fact, high health care utilization may be indicative of internalizing behavior within a family (Loiselle et al., 2012). In order to provide a framework for understanding the influences of multiple systems on pediatric health and health care utilization, the biopsychosocial model (BPS; Engel, 1977, 1980) will be used as a guide for this article.

Parental Influence on Child Health Care Utilization

Becoming aware of the biological, psychological and social influences that impact children, their parents, and families will give researchers and clinicians a more inclusive picture of patients' needs, and how the providers can attend to these needs (especially as they relate to health care utilization). As an alternative to the more dominant biomedical model, the biopsychosocial (BPS) model was introduced by Engel (1977) to provide a more systemic and comprehensive approach to health care. Compared to the biomedical model, the BPS model is based on a systems approach (von Bertalanffy, 1968) and is used to acknowledge that humans cannot be reduced or isolated to a single issue or diagnosis (Engel, 1980). Therefore, nothing exists in isolation; one cannot experience a biological problem without having some sort of psychological and social impact (Engel, 1977, 1980). When working through a BPS lens, social, psychological and biological factors are taken into account to gain a more comprehensive picture of health (Engel, 1977, 1980). To put this together, high health care utilization can be indicative of unmet biopsychosocial needs within a family (particularly in rural areas where these concerns are prevalent [Polaha et al., 2011]) and without a multi-systemic, BPS approach in a medical home model, the underlying issues fueling or exacerbating a child's biomedical presentation may be overlooked.

As previously mentioned, researchers have only begun to understand how family characteristics have an influence on child health care utilization. For example, characteristics such as maternal employment, education level, parental stress, family size and family dysfunction are said to predict children's medical referrals (Moran & O'Hara, 2006). In addition, several parental characteristics have been researched in conjunction with child health care utilization, such as parental depression (Olfson et al., 2003), parental self-efficacy, stress (Janicke & Finney, 2003), and conflict (Riley et al., 1993). There have been many explanations offered regarding the relationship between parental characteristics and child health care use, for instance, mothers may seek medical treatment for their child in an attempt to reduce their own feelings of anxiety and distress (Moran & O'Hara, 2006,). However, there are mixed findings on the influence of some of these characteristics, possibly due to the way in which researchers have measured parental characteristics and child health care use (e.g., there may be a lack of differentiation in some studies between preventative health care use and sick visit health care use, leading to unclear results as these categories of utilization may be impacted differently by parental characteristics) (Moran & O'Hara, 2006).

Additionally, sample differences may explain some variability in the results. Recent researchers have indicated that rural children experience additional health issues and disparities as compared to their non-rural counterparts (Polaha, Dalton, & Allen, 2011). Children in rural areas are more likely to have a sedentary lifestyle (Hortz, Stevens, Holden, & Petosa, 2009), higher incidences of asthma (Ernst & Cormier, 2000), and have parents with high rates of psychosocial problems (Polaha et al., 2011). Although researchers have reported relationships between parent characteristics such as depression (e.g., Flynn, Davis, Marcus, Cunningham & Blow, 2004; Minkovitz et al., 2005; Sills, Shetterly, Xu, Magid, Kempe, 2007), stress (e.g., Raphael et al., 2009) and parental responsiveness (e.g., Holland et al., 2012), a search of the literature yielded no articles that examined the influence of parental characteristics on child health care utilization in samples from rural areas. Rural samples may also experience differences in the availability of health care, as there are consistent shortages of primary care providers and pediatricians in rural areas (Farmer, Clark, Sherman, Marien, & Selva, 2005), as well as limited access to mental health care (Campbell, Kearns, & Patchin, 2006). All of these factors may possibly influence health care utilization in rural and under-served areas, influencing variability in research findings between rural and non-rural populations.

Taking into account the higher rates of parental psychosocial issues among rural populations (Polaha, 2011), child health care utilization may look different in rural populations. To fully understand the needs of pediatric patients and their families, it is vital to have systemic and BPS guided research that is generalizable to the rural population and will allow for providers to address issues with greater sensitivity to rural health care needs to aid in the prevention of health care overuse and/or underuse, minimizing overall costs and maximizing benefits. The purpose of the current study is to understand more about the influence of parent/caregiver biopsychosocial characteristics on child health care utilization in a rural population.

Method

Study Design

A descriptive cross-sectional study was conducted to explore the following research question: Is there a relationship between parent/guardian psychosocial health characteristics (anxiety, depression, distress, parenting self-efficacy, perceived social support and quality of life) and the frequency of child health care utilization? This design was chosen for this study as it most appropriately answers the question of prevalence, identifies associations and allows for multiple variables to be studied (Mann, 2003). The independent variables measured in the study were: (a) parental self-efficacy as measured by the Parent Self-Agency Measure (Dumka et al., 1996), (b) anxiety and depression as measured by the Patient Health Questionnaire for Anxiety and Depression (PHQ-4; Kroenke et al., 2009), (c) perceived social support using the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988), and (d) parent health-related quality of life using the Short-Form 12, version 2 (SF-12v2; Ware et al., 2006). Demographic variables included caregiver relationship to patient (e.g., mother, father, legal guardian), parent/guardian age and ethnicity, child age and ethnicity, total number of children in household, relationship status, highest level of education, annual income, current employment, and hours per week spent working outside of the home. The dependent variable data on child health care utilization was gathered from two sources: (a) the clinic electronic medical record (EMR) system, and (b) parent/guardian self-report. The hypotheses for this study were as follows:

1. Increased parent/guardian anxiety, depression, and distress and lower levels of parenting self-efficacy, perceived social support, and quality of life will be associated with increased child health care utilization, while decreased parent guardian anxiety, depression, and distress and higher levels of parenting self-efficacy, perceived social support, and quality of life will be associated with decreased child health care utilization.
2. Poorer parent/guardian physical health will be associated with increased child health care utilization, while increased parent/guardian physical health will be correlated with decreased child health care utilization.

Approval was gained from the East Carolina University and Medical Center Institutional Review Board (IRB) prior to data collection.

Participants.

Data were collected from a rural eastern community health center that serves a predominantly pediatric population. The county that the health center serves is predominately White non-Hispanic (77.1%), and 20.5% African American; median household income for the county is $43,658, with 12.2% below the poverty level. Inclusion criteria for participation were: (a) adult and primary parent/guardian of the child, who was between the ages of 2 to 17, being seen for the medical visit; (b) parent, or legal guardian of the child (i.e., have legal responsibility for the child), (c) able to speak and read English, and (d) able to read at approximately an eighth grade level. Exclusion criteria included an inability to complete the clinical questionnaire because of mental incapacitation (lacking power, strength, or capacity to consent or participate in the study).

Data collection and procedures.

The participants were recruited by the first author after they checked in for the child’s medical visit and were placed in an exam room. The parent/guardian of pediatric patients were informed about the study, and if eligibility criteria were met and written consent was obtained for their participation, they were provided a survey packet to fill out while waiting for the child’s medical appointment. Children over the age of seven (Kimberly, Hoehn, Feudtner, Nelson & Schreiner, 2006; National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978) were given a separate assent form written in age-adjusted language (Kimberly et al., 2006). Children under the age of seven were read an assent form and asked for verbal assent. Upon completion of the questionnaires, participants had the option of entering their contact information in a raffle for a chance to win one of three $25 gas cards, drawn at the conclusion of data collection.

Measures

In addition to the multiple measures listed below, basic demographic information was collected from each participant which included the participant’s relationship to the pediatric patient (e.g., mother, father), the participant’s age and ethnicity, the child’s age and ethnicity, the participant’s total number of children, relationship status, highest level of education, annual income, employment status and profession, along with parent/guardian’s medical and mental health diagnoses, and any medications that the caregiver was taking at the time of the survey.

Health care utilization.

Child health care utilization data were gathered via direct chart review by the lead researcher. Data included the total number of visits and phone calls made by a caregiver about the child in the 12 months prior to the questionnaire distribution. Researchers differentiated between well-check visits and sick visits. Data on number of integrated care visits (i.e., visits where the primary care provider and behavioral health provider saw the patient at some point during the same patient visit) and number of traditional behavioral health appointments (i.e., child and/or family members met with the behavioral health provider only) were also collected. Visits for laboratory procedures were excluded. The caregivers (parents/guardians) also provided an estimate as to how many visits the caregivers made to an after-hours urgent care/emergent care facility for their own health in the past 24 months.

Parental self-agency.

The Parent Self-Agency Measure (PSAM; Dumka et al., 1996) was used to measure parents' level of confidence in their ability to be successful parents. It has five questions with answers on a seven-point Likert-type scale. The range of answers is scaled from one (rarely) to seven (always). Cronbach's alpha was reported to be in the range of .68 to .70 (Dumka et al., 1996). A more recent study involving the measure reported an alpha level of .81 (Coleman & Karraker, 2000), with a sample of predominately White non-Hispanic mothers. A sample item includes, "I know I am doing a good job as a mother/father" (Dumka et al., 1996, p. 219). Higher scores on the measure indicate more positive self-efficacy in parents (Coleman & Karraker, 2000; Dumka et al., 1996). This measure has not been used with rural populations.

Anxiety and depression.

The Patient Health Questionnaire for Depression and Anxiety (PHQ-4) was used as a brief measure for anxiety and depression (Kroenke et al., 2009), and is a composite of two ultra-brief screening tools that have been developed and validated (Lowe et al., 2010), the GAD-2 (Kroenke, Spitzer, Williams, Monahan, & Lowe, 2007) and the PHQ-2 (Kroenke, Spitzer, & Williams, 2003). The PHQ-2 "is the most validated 2-item screener for depression" (Lowe et al., 2010, p. 87). Both the GAD-2 and the PHQ-2 have been normed for use with a variety of racial and ethnic groups (Chunyu, Friedman, Conwell, & Fiscella, 2007; Gjerdingen, Crow, McGovern, Miner, & Center, 2009; Lowe et al., 2010; Monahan et al., 2007). A variation of this measure, the PHQ-9, has been used with a rural population (Bergus et al., 2005). Anxiety is considered a score greater than 3 on the anxiety subscale, and depression is considered for patients who receive a score greater than 3 on the depression subscale, and Cronbach's alpha = .85. The participants for the measure were asked, "Over the last two weeks, how often have you been bothered by the following problems" with the option of the following responses, "not at all, several days, more than half the days, or nearly every day" (Kroenke et al., 2009, p. 615).

Distress.

The Distress Thermometer (DT) was used to measure emotional distress (Roth, Kornblith, Batel-Copel, Peabody, Scher, & Holland, 1998). This is a single-item self-report measure that is an 11-point scale with one end of the scale labeled as "No distress" and 10 as "Extreme distress" (Roth et al., 1998). Participants circle the number that best describes their level of distress in the past seven days. A cut-off score of 4 indicates distress and the measure is reported to have acceptable reliability (.70) and validity (.70) (Ransom, Jacobson & Booth-Jones, 2006). The DT is sometimes used in conjunction with the Patient Problem List (National Comprehensive Cancer Network, 2007), which was also used in this study. The Patient Problem List has five categories: practical problems, family problems, emotional problems, spiritual/religious concerns, and physical problems, and participants indicate if they have experienced any of the problems in the past week by marking yes or no (National Comprehensive Cancer Network, 2007). The DT has been used in research with rural populations (e.g., Graves et al., 2007).

Health related quality of life.

The SF-12v2 was used to measure eight domains of health-related quality of life: physical functioning, role limitations related to physical health, bodily pain, general health, vitality, social functioning, role limitations related to emotional problems, and mental health (Ware et al., 1996). These items yield the Physical Component Summary (PCS) and the Mental Component Summary (MCS). This is a 12-item questionnaire with answers provided in a Likert-type scale. A sample question is, “In general, would you say your health is: 1) Excellent, 2) Very Good, 3) Good, 4) Fair, or 5) Poor” (Ware et al., 1996). Internal consistency reliability has been estimated at .91 for the PCS measure and .87 for the MCS measure (Ware et al., 2010). This measure has been used with rural populations (e.g., Tommis et al., 2007). Cut-off scores for the measure are dependent on the participant’s age range; mean scores are provided for ten-year age groups. Scores higher than the mean in a particular age group indicate a better health status than most others in the age range, and lower indicates poor health (Ware et al., 1996).

Perceived social support.

To measure social support, the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) was used. There are a total of 12 statements on the MSPSS, with answers on a seven-point Likert-type scale. The answers are scaled from 1 (very strongly disagree) to 7 (very strongly agree). A sample question is, “I get the emotional help and support I need from my family” (Zimet et al., 1988, p. 35). Higher scores indicate higher social support. There are three subscales of the MSPSS; significant other, family and friends. The reliability of the total scale was reported as 0.85, whereas the alpha level for the significant other, family, and friends subscales were 0.72, 0.85, and 0.75, respectively (Zimet et al., 1988, p. 36). This measure has been used with rural populations (e.g., Yoon & Lee, 2006).

Statistical Analyses

Data gathered from the surveys paired with utilization counts from the electronic medical records were used for the analyses. Prior to modeling the data, univariate statistical analyses investigating central tendency (e.g., mean) and dispersion (e.g., standard deviation) were completed. Bivariate statistical analyses (e.g., Spearman correlations) were also performed along with visual summaries (e.g., histogram, scatterplots and boxplots). The research questions were explored using Poisson regression modeling. After running initial univariate and bivariate statistical analyses, many of the psychosocial measures were highly correlated (including the PHQ-4, DT, Problem List, PSAM, and MSPSS) thus, the MCS subscale of the SF-12v2 was used as the psychosocial measure, and the PCS subscale of the SF-12v2 was used to measure physical health. As such, hypotheses were slightly altered from their original form.

To investigate the first hypothesis, “Decreased parent/guardian mental health quality of life will be associated with increased acute child health care utilization,” child health care utilization counts served as the dependent variable as reported by the EMR, while mental health quality of life, using the MCS subscale of the SF-12v2 (Ware et al., 2006) and demographics served as the independent variables in the analysis.

To explore the second hypothesis, “Decreased parent/guardian mental health quality of life will be associated with decreased non-acute child health care utilization,” child health care utilization counts served as the dependent variable as reported by the EMR, while mental health quality of life, using the MCS subscale of the SF-12v2 (Ware et al., 2006) and demographics served as the independent variables in the analysis.

To test the third hypothesis, “Poorer parent/guardian physical health will be correlated with increased acute child health care utilization,” child health care utilization counts from the

EMR served as the dependent variable, while quality of life – PCS component via the SF-12v2 (Ware et al., 2006) along with demographics served as the independent variables in the analysis.

To explore the final hypothesis, "Poorer parent/guardian physical health will be correlated with decreased non-acute child health care utilization" child health care utilization counts from the EMR served as the dependent variable, while quality of life – PCS component via the SF-12v2 (Ware et al., 2006) and demographics served as the independent variables in the analysis.

Results

A total of 88 participants made up the sample for this study; eight potential participants declined to take the survey when asked, and an additional five participants did not complete the survey for an 87% response rate. Initial univariate statistical analyses were run (e.g., mean, standard deviation) to understand more about the demographics of the sample. Table 1 describes the participant (parent/guardian) characteristics, and Table 2 summarizes the child/patient characteristics. Participants primarily identified as the patient's mother (87.5%), White non-Hispanic (78.41%) or African American (15.91%), and almost half of participants reported some college or technical school (46.59%). Nearly half (44.32%) of the participants reported that they were not currently working at the time of the study. Children of participants were also primarily White non-Hispanic (71.59%), with an average age of 7.57 (*SD* = 4.28); the average number of children per household was 2.08 (*SD* = 1.22), with 39% of parents reporting only one child in the home.

Nearly one third of participants identified as having an annual household income range of $10,000-$19,999 (28.41%), with the second largest group of participants reporting an annual household income of less than $10,000 (17.05%). The 2013 United States poverty guidelines for a family of two is $15,510 and four is $23,500 (US Department of Health and Human Services, 2013); assuming family size of at least two to four people, the majority of participants fall below the poverty level. Consistent with this, the majority of the children in this study had health care coverage by Medicaid or other public assistance (75%).

Child diagnoses (per the patient's chart review) are summarized in Table 3; over half of the patients involved in this study had a previous diagnosis of asthma (55.68%), with a lower portion of children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD; 17.05%), a gastrointestinal complaint (20.45%), and fewer with diagnoses of anxiety and depression (10.23% and 3.41%, respectively). Table 4 shows the mean number of acute and non-acute visits by the children to the clinic.

Highlighted in Table 5 are the different biopsychosocial measures that parents/guardians were asked to complete as part of the survey (e.g., PHQ-4, SF-12v2). Most parents reported feeling confident in their parenting self-efficacy (*M* = 30.92, *SD* = 4.90, maximum score of 35), most reported fairly low scores of depression and anxiety on the PHQ-4 (M = 2.49, *SD* = 3.30, maximum score 12). Additionally, the average score on the distress thermometer was 2.76 (*SD* = 2.86, maximum score of 10), indicating that most of the participants fell below the cut-off score of 4 for distress.

Initial correlations indicated that many of the biopsychosocial measures were highly correlated with one another (see Table 6). For example, the PHQ-4 (measuring depression and anxiety) was highly correlated with the Distress Thermometer (measuring distress; *r* = 0.83). The PHQ-4 was also highly negatively correlated with the MCS component of the SF-12v2 (*r* = -0.80), and highly positively correlated with the Problem List (*r* = 0.78), and moderately negatively correlated with the Parenting Self-Efficacy Scale (*r* = -0.59) and the MSPSS (*r* = -0.64). As many of these scales were measuring psychosocial health, the high correlations between the measures were not fully unexpected. As such, the MCS and PCS subscales of the SF12-v2 were chosen to be used in the multivariate analyses to avoid biased results due to highly correlated input measures.

Associations were found between parental biopsychosocial measures and children's diagnoses (see Table 7). For example, parents of children with a diagnosis of depression in their medical chart reported much lower mean scores on the social support inventory (*M* = 49.33, *SD* = 10.50), as compared to parents of children without depression (*M* = 72.27, *SD* = 16.14). A similar relationship was found between mean PHQ-4 scores and children with anxiety diagnoses; parents of children with an anxiety diagnosis had higher mean scores than children without (*M* = 5.44, *SD* = 4.28, *M* = 2.15, *SD* = 3.02, respectively). However, these results were not significant, possibly due to the size of the sample. Parents of children with obesity diagnoses had higher rates of lower parenting efficacy scores, higher PHQ-4 scores, lower social support scores, lower PCS and MCS SF-12v2 scores, and higher Distress Thermometer and Patient Problem List scores than parents of children without obesity diagnoses.

To identify the relationships between the parental biopsychosocial measures and the different categories of child health care visits, Spearman correlations were conducted (see Table 8). While significant correlations were noted, such as the relationship between the SF12-v2 MCS subscale and acute/sick visits ($r = 0.24$, $p = 0.03$), integrated care/medical family therapy visits ($r = 0.24$, $p = 0.02$), total visits ($r = 0.25$, $p = 0.02$), and total visits minus acute visits ($r = 0.25$, $p = 0.02$), and between the Distress Thermometer and acute/sick visits ($r = -0.22$, $p = 0.05$), more tests were needed (e.g., Poisson regressions) to identify if these are independent predictors

The effects of demographic variables on child health care utilization are portrayed in Table 8. Of note, White non-Hispanic participants reported more total non-acute visits for their children (*M* = 5.03, *SD* = 4.35) than Black/African American participants (*M* = 4.07, *SD* = 2.79) or participants of other races/ethnicities (*M* = 3.80, *SD* = 0.84). Children with Medicaid or other public health assistance were more likely to have more total acute/sick visits than children with private insurance (*M* = 6.82, *SD* = 5.53; *M* = 4.86, *SD* = 3.24, respectively). Additionally, parents who reported an annual household income of less than $10,000 had children with a higher mean of acute/sick visits (*M* = 8.00, *SD* = 4.81) when compared to parents who reported an income of greater than $50,000 (*M* = 5.29, *SD* = 3.02), although this was not significant (*p* = 0.49). Despite these findings, final conclusions about the study results were made from the Poisson regressions, and not from any unique bivariate analyses.

Multivariate Analyses

Poisson regression modeling was used for the multivariate analyses using JMP statistical software (SAS Institute Inc, 2013). Of note, JMP software uses the (-1,1) design framework instead of the (0,1) design for categorical variables in Poisson modeling, making individual parameter estimates difficult to interpret as they do not have direct information on health care utilization rates. Thus, the significance levels (*p*-values) provided in the tables may provide a clearer picture of each covariates relative impact.

To address hypotheses one and three regarding the influence of parental mental health quality of life and physical health quality of life on child acute visits, an initial Poisson regression model (see Table 9) was run with the following variables: employment, age of parents, child insurance, child diagnoses (depression, anxiety, asthma, obesity, ADHD, family disruption, GI complaint), SF12v2-PCS subscale, SF12v2-MCS subscale, Distress Thermometer, and race/ethnicity of parents with acute/sick visits. These variables were included based upon the results of the preliminary analyses to highlight the entire effect of certain variables, which can be challenging in cases where variables have more than one degree of freedom. Thus, the effect test tables (e.g., Tables 10, 11, 13, 14) are representing the impact of each of the variables after accounting for all of the others. The full model showcases strong relationships between the demographic variables, parental biopsychosocial metrics, and child diagnoses. From this model (Table 9), variables were removed in similar groups to establish a final model with the best fit, based on significance of the variables and Akaike information criterion (AIC) criterion. The AIC is a measure of the quality of a model for a particular set of data (Akaike, 1974).

The final Poisson regression model can be seen in Tables 11 and 12 for acute/sick visits. From this model, the interaction between lower age of parents, child diagnoses of asthma, anxiety, and obesity, increased parental physical and mental quality of life and race/ethnicity were indicative of higher acute/sick health care utilization. Regarding race/ethnicity, there was not enough power for individual tests to determine the exact differences between the racial/ethnic groups and health care utilization, but it was found that race influences the acute/sick visit utilization model. The positive parameter estimates indicate higher utilization, while negative values indicate lower health care utilization. For example, higher age of parents was associated with lower health care utilization (χ^2 [1, 88] = 7.62, $p = 0.0058$), whereas higher scores on the SF12-v2 PCS (χ^2 [1,88] = 8.14, $p = 0.0043$) and MCS (χ^2 [1, 88] = 10.34, $p = 0.0013$) subscales were associated with higher acute health care utilization. Child diagnoses of asthma (χ^2 [1, 88] = 7.18, $p = 0.0074$), anxiety (χ^2 [1,88] = 4.36, $p = 0.0368$), and obesity (χ^2 [1, 88] = 4.30, $p = 0.0381$) were also associated with higher acute utilization in this model.

To address hypotheses two and four, regarding the influence of parental mental health quality of life and physical health quality of life on child non-acute visits, an initial Poisson regression model was run for non-acute visits (see Table 13) and included the following variables: age of parents, child insurance, child diagnoses (depression, anxiety, asthma, obesity, ADHD, family disruption, GI complain), SF12v2-PCS subscale, SF12v2-MCS subscale, Distress Thermometer, and race/ethnicity of parents. As with the acute/sick Poisson model, variables were removed to find a final model with the best fit (see Tables 14 and 15) for non-acute visits. For non-acute visits, the interaction between children's diagnosis of anxiety (χ^2 [1,88] = 8.46, p = 0.0036) and higher parental mental health quality of life (χ^2 [1,88] = 5.89, p = 0.0152) were indicative of higher utilization.

Discussion

The purpose of this study was to explore the relationship between parental biopsychosocial characteristics and child health care utilization in a rural population. Results from this study indicate that there are interactional patterns between parental biopsychosocial and demographic characteristics and child diagnoses that influence both acute and non-acute child health care utilization in a rural population. Additionally, it was found that many of the psychosocial measures initially included in the study (e.g., PHQ-4, DT, Problem List, SF12-v2 MCS) were highly correlated with one another. Associations were also found between parental biopsychosocial measures and children's diagnoses (see Table 7). For example, diagnoses of depression and obesity were associated with fairly large differences in scores for all seven biopsychosocial measures as compared to scores on the biopsychosocial measures for parents of children without those diagnoses. While future researchers may want to continue research on the relationship between child diagnoses and parent biopsychosocial measures, the findings in the current study were inconclusive due to low representation for many of the diagnoses (e.g., depression [n = 3], and obesity [n=10]).

As stated in the results, significant correlations were also found between the parental biopsychosocial measures and the types of child health care visits (see Table 8), notably with the SF12-v2 MCS and acute/sick visits, integrated care/medical family therapy visits, total visits, and total non-acute visits, and between the DT and acute/sick visits. However, the correlations were fairly weak and additional tests revealed that these were not independent predictors of health care utilization. Future researchers may want to further investigate these relationships with a larger sample size for increased power.

Poisson regression modeling showed that the interaction between lower age of parents, parental physical and mental quality of life, parental race/ethnicity, and child diagnoses of asthma, obesity, and anxiety influence acute child health care utilization. Although researchers have found in non-rural samples that depression (Minkovitz et al., 2005) and anxiety (Janicke et al., 2001), (facets of parental mental health quality of life) lead to an increase in acute visits, the current study found the opposite; *increased* parental mental health quality of life was related to increased acute/sick visits. This may be related to several factors; for example, parents with higher mental health, physical health, and overall well-being may have the resources and support needed to take their child to the clinic when the child is not feeling well. These parents may be more likely to recognize when their child is ill, as they are not burdened by their own health problems.

Regarding ethnicity, previous researchers have found mixed results on the influence of race/ethnicity on child health care utilization. Some researchers have purported that it is not an influential variable (e.g., Janicke et al., 2001, Olfson et al., 2003), while others (e.g., Flores, Olson, & Tomany-Korman) have found a relationship between ethnicity and utilization (e.g., minority parents made fewer phone calls to their child’s primary care clinic, but had more ED visits and hospital stays). Differences may be due to geographic location of the study (e.g., urban, suburban, rural) and sample size; in the current study, the majority of participants were White non-Hispanic (n=69), with fewer participants identifying as African American (n=14), or "other" (e.g., Hispanic; n=5), possibly impacting the influence of race/ethnicity on child health care utilization.

Regarding parent physical health, researchers in one study found that mothers who reported their own health as poor were more likely to report their child's health as poor (Waters et al., 2000), though the study did not directly investigate utilization. In the current study, parents with better reports of physical health were more likely to take their child to the clinic for acute visits, appearing to be the opposite of the previous findings given the assumption that poorer health (per Waters et al., 2000) is consistent with greater health care utilization. Concerning child medical diagnoses, asthma (Akinbami, Moorman, & Liu, 2011), obesity (Trasande & Chatterjee, 2009) and anxiety (Ramsawh, Chavira, & Stein, 2010) have been associated in the literature with increased health care utilization among urban populations, findings that were confirmed among rural populations in this study.

Additionally, the current model identified parental age as a factor influencing acute child health care utilization, a finding not supported in the literature as a significant variable impacting child utilization (e.g., Minkovitz, O'Campo, Chen, Grason, 2002; Zimmer, Walker, & Minkovitz, 2006). Older parents may be less likely to bring their children in for minor acute issues as they may have more experience than younger parents or may feel less anxiety when their child is ill and be more likely to let an illness run its course.

Regarding non-acute visits, the interaction between parental mental health quality of life and a diagnosis of anxiety for the child were indicative of increased non-acute visits. The relationship between better mental health of parents and child non-acute visits was supported by other researchers; parents with better mental health were more likely to have children with routine *preventative* care visits (e.g., Holland et al., 2012; Janicke et al., 2001). As such, parents with increased mental health may be more capable of tending to their child's health care needs.

Although initially included to measure parenting self-efficacy (e.g., PSAM), depression and anxiety (e.g., PHQ-4), social support (e.g., MSPSS) and general issues of stress (e.g., Problem List), these measures were found to be highly correlated with one another and the SF12-v2 MCS scale, and were not included in the final model to avoid confounding issues. Multicollinearity of these measures was established after running correlational statistical analyses. As such, only three of the seven initial measures (SF12-v2 MCS and PCS subscales, DT) were used in the initial Poisson regression modeling, and only two of the measures (SF12-v2 MCS and PCS subscales) were used in a final Poisson regression model. While parenting self-efficacy (Janicke & Finney, 2003), depression and anxiety (Moran & O'Hara, 2006; Olfson et al., 2003), social support (Janicke & Finney, 2001), general stress (Raphael et al., 2009) and distress (Janicke & Finney, 2003) had been identified in the literature as parental components contributing to child health care utilization, the measures used in this study did not indicate a strong relationship.

Limitations

Although the current study identified many variables that lead to increased child health care utilization in a rural setting, there are several limitations to note. Primarily, there was a relatively small sample size (N=88), limiting the statistical power and ability to run certain analyses (e.g., between individual variables). Challenges with sample size have been cited in the literature as fairly common in rural research, and may be due to participant concerns with anonymity, population density in general (e.g., there are just fewer people), and negative perceptions of research by the rural community (Lim, Follansbee-Junger, Crawford, & Janicke, 2011). Second, the participants in the research were primarily White non-Hispanic mothers, limiting the generalizability of the study findings to other racial/ethnic groups and fathers/others. However, the study sample was fairly consistent with the county in which the study took place, as it is predominately White non-Hispanic (77.1%), and supports reports in the literature that pediatricians are more likely to see children with their mothers rather than children with their fathers (Coleman & Garfield, 2004). A third potential limitation involves income; a large majority of the sample in this study identified as having an income close to or less than the poverty level; this is inconsistent with the poverty level reported by the county. As such, the income of the sample in the study may not accurately represent the entire county in which the study took place. Similarly, while a large amount of the sample identified with an income close to the poverty level, a majority of the same did not reach the cut-off for distress on the DT, seeming counter-intuitive given the stressors associated with low-income families (Santiago, Wadsworth & Stump, 2009). Thus, the DT may not have been an accurate measure of life distress in this sample. Finally, as the parental responses were based on information collected via surveys, all components (excluding child health care utilization counts) were self-reported data.

Implications

This study provides evidence that parental biopsychosocial characteristics do influence child acute and non-acute health care utilization in a rural population. To maximize patient health and minimize cost to the health care system (Romaire, Bell, & Grossman, 2012), it is vital to address issues of excessive and/or inadequate health care utilization. This information may be of importance to behavioral health providers working in rural primary care clinics; screening parents for physical and mental health quality of life may aid behavioral health and primary care providers in addressing potential issues of over-or-under use before they even occur. Understanding that parents with lower physical or mental health quality of life may be less likely to bring their child in for acute or non-acute visits in rural areas may initiate programs (e.g., routine parental screenings, extra support for families from the behavioral health professional) to assure that these children are getting the care they need, when they need it. This may be particularly necessary for children with certain diagnoses, such as asthma, anxiety, or obesity; behavioral health and primary care providers who are aware of the relationship between these diagnoses and health care utilization may be able to be proactive in how utilization issues are approached. Additionally, future researchers should also examine the influence of parental BPS characteristics on child health care utilization with a larger and more diverse rural population to increase the generalizability of the findings and understand more about the needs in rural communities.

As evidenced by the findings of this study, parental BPS characteristics and child diagnoses impact both acute and non-acute child health care utilization. To appropriately address these needs of children and their families that impact utilization, screening processes must take place in pediatric clinics to identify where the needs lie to establish appropriate interventions. When compared to the final model for acute visits, there were no physical variables (e.g., parental physical health quality of life, child diagnoses of asthma, obesity) that significantly influenced non-acute utilization. As such, clinicians need to be aware of the differences in the family dynamics that influence types of utilization; interventions should target different concerns based on the type of utilization of focus (e.g., acute vs. non-acute). For example, when attempting to influence non-acute visit utilization frequency, the mental health concerns of the parent/child may be best targeted by behavioral health clinicians working in primary care (per the findings of this study). When attempting to influence the frequency of acute visits, concerns such as parent physical health (in conjunction with other BPS concerns) may be best addressed by behavioral health clinicians. Behavioral health clinicians in pediatric clinics may also spend time understanding the dynamics of the families of patients, and how these dynamics impact utilization for intervention purposes. These interventions need to be developed and tested via efficacy and effectiveness studies in rural locations to address issues of parental characteristics and child health care utilization.

As child diagnoses of asthma, anxiety, and obesity were part of the model indicative of higher acute health care utilization, systemic interventions are needed to help address these issues. Pediatric asthma interventions that are focused on the family unit are supported by researchers (e.g., Clark, Mitchell & Rand, 2009). More specifically, it is known in the literature that stress can exacerbate asthma (Bloomberg & Chen, 2005; Murdock, Adams, Pears & Ellis, 2012), thus, implementing programs for children with asthma and their families to focus on stress management may help address utilization concerns due to asthma. Regarding pediatric obesity, the Expert Committee on the Assessment, Prevention, and Management of Child and Adolescent Overweight and Obesity recommends that providers address pediatric obesity as a family issue rather than a child problem, and treatment should take place within the family context (Gee, Rogers, Liu, & McGrath, 2007). Researchers have also identified that pediatric obesity interventions focused on the parents in medically underserved rural areas have led to significant changes in the child’s weight and were also cost-effective (Janicke et al., 2009). Regarding anxiety, members of the American Academy of Pediatrics Task Force on Mental Health encouraged providers to involve families in the treatment of child mental health concerns, focusing on family strengths and routinely assessing the needs of the child and their family during visits (Foy, 2010).

Finally, policies are needed to help initiate programs and reimburse for providing assistance to families in primary care, and not just the identified patient. Whereas the child may be the official patient of the clinic, parental issues and concerns can directly impact the well-being of the child and should be addressed. Current integrated care models such as the medical home (Laraque & Sia, 2010) may be best-suited for incorporating the findings of this study. Options for family-based treatment (instead of child-only treatment) to address systemic concerns (e.g., family stress, parental mental health) that lead to health care over or under-utilization is necessary in pediatric primary care settings, regardless of the financial capabilities or geographic location of the families, as systemic treatment has been shown in the literature to reduce health care utilization (Law & Crane, 2000).

The findings of this research article are indicative of a relationship between parent BPS characteristics and child health care utilization (acute and non-acute) in a rural population. As such, it is necessary for clinicians to routinely assess not only for the child's BPS concerns, but for parental concerns as well. Becoming aware of the needs of the entire family may help to reduce or eliminate unnecessary utilization and positively influence the child's well-being (Garg, Marino, Vikani, & Solomon, 2012). As such, policy is needed to initiate programs and provide reimbursement for providers who are addressing both parent and child BPS needs in rural pediatric primary care.

REFERENCES

Akaike, H. (1974). A new look at the statistical model identification. *Automatic Control, IEEE Transactions, 19,* 716-723.

Akinbami, L.J., Moorman, J.E., & Liu, X. (2011). Asthma prevalence, health care use, and mortality: United States, 2005-2009. *National Health Statistics Reports, 32,* 1-16.

American Academy of Pediatrics. (1992). Ad hoc task force on definition of the medical home: The medical home. *Pediatrics, 90,* 774-778.

Bergus, G.R., Hartz, A.J., Noyes, R., Ward, M.M., James, P.A., Vaughn, T., Kelley, P.L., Sinift, S.D., Bentler, S., & Tilman, E. (2005). The limited effect of screening for depressive symptoms with the PHQ-9 in rural family practices. *The Journal of Rural Health, 21,* 303-309.

Bloomberg, G. R., & Chen, E. (2005). The relationship of psychologic stress with childhood asthma. *Immunology and Allergy Clinics of North America, 25,* 83-105.

Campbell, C.D., Kearns, L.A., & Patchin, S. (2006). Psychological needs and resources as perceived by rural and urban psychologists. *Professional Psychology: Research and Practice, 37,* 45-50.

Chunyu, L., Friedman, B., Conwell, Y., & Fiscella, K. (2007). Validity of the Patient Health Questionnaire 2 (PHQ-2) in identifying major depression in older people. *Journal of the American Geriatrics Society, 55,* 596-602.

Clark, N.M., Mitchell, H.E., & Rand, C.S. (2009). Effectiveness of educational and behavioral asthma interventions. *Pediatrics, 123,* S185-S192.

Coleman, W.L., & Garfield, C. (2004). Fathers and pediatricians: Enhancing men's roles in the care and development of their children. *Pediatrics, 113,* 1406-1411.

Coleman, P.K., & Karraker, K.H. (2000). Parenting self-efficacy among mothers of school-age children: Conceptualization, measurement, and correlates. *Family Relations, 49,* 13-24.

Dumka, L., Stoerzinger, H., & Jackson, K., & Roosa, M. (1996). Examination of the cross-culture and language equivalence of the Parenting Self-Agency Measure. *Family Relations, 45,* 216-222.

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196,* 129-136.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry, 137,* 535-544.

Ernst, P., & Cormier, Y. (2000). Relative scarcity of asthma and atopy among rural adolescents raised on a farm. *American Journal of Respiratory Critical Care Medicine, 161,* 1563-1566.

Farmer, J.E., Clark, M.J., Sherman, A., Marien, W.E., & Selva, J.T. (2005). Comprehensive primary care for children with special health care needs in rural areas. *Pediatrics, 116,* 649-656.

Flores, G., Olson, L., & Tomany-Korman, S.C. (2005). Racial and ethnic disparities in early childhood health and health care. *Pediatrics, 115,* e183-e193.

Flynn, H.A., Davis, M., Marcus, S.M., Cunningham, R., & Blow, F.C. (2004). Rates of maternal depression in pediatric emergency department and relationship to child service utilization. *General Hospital Psychiatry, 26,* 316-322.

Garg, A., Marino, M., Vikani, A.R., & Solomon, B.S. (2012). Addressing families’ unmet social needs within pediatric primary care: The health leads model. *Clinical Pediatrics, 51,* 1191-1193.

Gee, S., Rogers, V., Liu, L., & McGrath, J. (2007). Expert committee recommendations on the assessment, prevention and treatment of child and adolescent overweight and obesity: An implementation guide from the Childhood Obesity Action Network. Retrieved from http://www2.aap.org/obesity/pdf/COANImplementationGuide62607FINAL.pdf

Gjerdingen, D., Crow, S., McGovern, P., Miner, M., & Center, B. (2009). Postpartum depression screening at well-child visits: Validity of a 2-question screen and the PHQ-9. *Annals of Family Medicine, 7,* 63-70.

Graves, K.D., Arnold, S.M., Love, C.L., Kirsh, K.L., Moore, P.G., & Passik, S.D. (2007). Distress screening in a multidisciplinary lung cancer clinic: Prevalence and predictors of clinically significant distress. *Lung Cancer, 55,* 215-224.

Holland, M.L., Yoo, B.K., Kitzman, H., Chaudron, L., Szilagyi, P.G., Temkin-Greener, H. (2012). Mother-child interactions and the associations with child health care utilization in low-income urban families. *Maternal and Child Health Journal, 16,* 83-91.

Hortz, B., Stevens, E., Holden, B., & Petosa, R.L. (2009). Rates of physical activity among Appalachian adolescents in Ohio. *The Journal of Rural Health, 25,* 58-61.

Janicke, D. M., & Finney, J. W. (2003). Children's primary health care services: Social-cognitive factors related to utilization. *Journal of Pediatric Psychology, 28,* 547-558.

Janicke, D.M., Finney, J.W., & Riley, A.W. (2001). Children's health care use: A prospective investigation of factors related to care-seeking. *Medical Care, 39,* 990-1001.

Janicke, D.M., Sallinen, B.J., Perri, M.G., Lutes, L.D., Silverstein, J.H., & Brumback, B. (2009). Interventions for pediatric obesity in medically underserved rural settings. *The Journal of Rural Health, 25,* 326-330.

Kimberly, M.B., Hoehn, K.S., Feudtner, C., Nelson, R.M., & Schreiner, M. (2006). Variation in standards of research compensation and child assent practices: A comparison of 69 institutional review board-approved informed permission and assent forms for 3 multicenter pediatric clinical trials. *Pediatrics, 117,* 1706-1711.

Kroenke, K., Spitzer, R.L., & Williams, J.B. (2003). The Patient Health Questionnaire-2: Validity of a two-item depression screener. *Medical Care, 41,* 1284-1292.

Kroenke, K., Spitzer, R.L., Williams, J.B.W., & Lowe, B. (2009). An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics, 50,* 613-621.

Kroenke, K., Spitzer, R.L., Williams, J.B., Monahan, P.O., & Lowe, B. (2007) Anxiety disorders in primary care: Prevalence, impairment, comorbidity and detection. *Annals of Internal Medicine, 146*, 317-325.

Laraque, D., & Sia, C.C.J. (2010). Health care reform and the opportunity to implement a family-centered medical home for children. *Journal of the American Medical Association, 303,* 2407-2408.

Law, D.D., & Crane, D.R. (2000). The influence of marital and family therapy on health care utilization in a health-maintenance organization. *Journal of Marital and Family Therapy, 26,* 281-291.

Lim, C.S., Follansbee-Junger, K.W., Crawford, M.S., & Janicke, D.M. (2011). Treatment outcome research in rural pediatric populations: The challenge of recruitment. *Journal of Pediatric Psychology, 36,* 696-707.

Loiselle, K.A., Lee, J.L., Gilleland, J., Campbell, R., Simpson, P., Johnson, G., Dooley, K., & Blount, R. L. (2012). Factors associated with health care utilization among children with noncardiac chest pain and innocent heart murmurs. *Journal of Pediatric Psychology, 37,* 817-825.

Long, W.E., Bauchner, H., Sege, R.D., Cabral, H.J., & Garg, A. (2012). The value of the medical home for children without special health care needs. *Pediatrics, 129,* 87-98.

Lowe, B., Wahl, I., Rose, M., Spitzer, C., Glaesmer, H., Wingenfeld, K., Schneider, A., & Brahler, E. (2010). A 4-item measure of depression and anxiety: Validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population. *Journal of Affective Disorders, 122,* 86-95.

Mann, C.J. (2003). Observational research methods. Research design II: Cohort, cross sectional, and case control studies. *Emergency Medicine Journal, 20, 54-60.*

Minkovitz, C.S., O'Campo, P.J., Chen, Y.H., & Grason, H. A. (2002). Associations between maternal and child health status and patterns of medical care use. *Ambulatory Pediatrics, 2,* 85-92.

Minkovitz, C.S., Strobino, D., Scharfstein, D., Hou, W., Miller, T., Mistry, K.B., & Swartz, K. (2005). Maternal depressive symptoms and children's receipt of health care in the first 3 years of life. *Pediatrics, 115,* 306-314. .

Monahan, P.O., Shacham, E., Reece, M., Kroenke, K., Ong'or, W.O., Omollo, O., Yebei, V.N., & Ojwang, C. (2008). Validity/reliability of PHQ-9 and PHQ-2 depression scales among adults living with HIV/AIDS in western Kenya. *Journal of General Internal Medicine, 24,* 189-197.

Moran, T.E., & O'Hara, M.W. (2006). Maternal psychosocial predictors of pediatric health care use: Use of the common sense model of health and illness behaviors to extend beyond the usual suspects. *Clinical Effectiveness in Nursing, 952,* 171-180.

Murdock, K.K., Adams, S.K., Pears, E., & Ellis, B. (2012). Caregiving load and pediatric asthma morbidity: Conflict matters. *Families, Systems, & Health, 30,* 101-113.

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1978) *The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.*Washington, DC: US Government Print Office.

National Comprehensive Cancer Network. (2007). *Clinical practice guidelines in oncology: Distress management (v.1.2008).*Retrieved August 25, 2012, from http://www.nccn.org/professionals/physician_gls/PDF/distress.pdf.

Olfson, M., Marcus, S.C., Druss, B., Pincus, H.A., & Weissman, M.M. (2003). Parental depression, child mental health problems, and health care utilization. *Medical Care, 41,* 716-721.

Polaha, J., Dalton, W.T., & Allen, S. (2011). The prevalence of emotional and behavioral problems in pediatric primary care serving rural children. *Journal of Pediatric Psychology, 36,* 652-660.

Ramsawh, H.J., Chavira, D.A., & Stein, M. B. (2010). Burden of anxiety disorders in pediatric medical settings: Prevalence, phenomenology, and a research agenda. *Archives of Pediatric and Adolescent Medicine, 164,* 965-972.

Ransom, S., Jacobsen, P.B., & Booth-Jones, M. (2006). Validation of the distress thermometer with bone marrow transplant patients. *Psychooncology, 15,* 604-612.

Rapee, R.M., Schniering, C.A., & Hudson, J.L. (2009). Anxiety disorders during childhood and adolescence: Origins and treatment. *Annual Review of Clinical Psychology, 5,* 311-341.

Raphael, J.L., Zhang, Y., Liu, H., & Giardino, A.P. (2009). Parenting stress in US families: Implications for pediatric health care utilization. *Child: Care, Health and Development, 36,* 216-224.

Riley, A.W., Finney, J.W., Mellits, E.D., Starfield, B., Kidwell, S., Quaskey, S., Cataldo, M.F., Filipp, L., & Shematek, J.P. (1993). Determinants of children's health care use: An investigation of psychosocial factors. *Medical Care, 31,* 767-783.

Romaire, M.A., Bell, J.F., & Grossman, D.C. (2012). Health care use and expenditure associated with access to the medical home for children and youth. *Medical Care, 50,* 262-269.

Roth, A.J., Kornblith, A.B., Batel-Copel, L., Peabody, E., Scher, H.I., & Holland, J.C. (1998). Rapid screening for psychologic distress in men with prostate carcinoma: A pilot study. *Cancer, 82,* 1904-1908.

Santiago, C.D., Wadsworth, M.E., Stump, J. (2009). Socioeconomic status, neighborhood disadvantage, and poverty-related stress: Prospective effects on psychological syndromes among diverse low-income families. *Journal of Economic Psychology, 32,* 218-230.

SAS Institute, Inc. (2013). JMP Version 10 [statistical software]. Cary, North Carolina.

Sills, M.R., Shetterly, S., Xu, Stanley, Magid, D., & Kempe, A. (2007). Association between parental depression and children's health care use. *Pediatrics, 119,* e829-e836.

Tommis, Y., Seddon, D., Woods, B., Robinson, C.A., Reeves, C., & Russel, I. (2007). Rural-urban differences in the effects on mental health well-being of caring for people with stroke or dementia. *Aging and Mental Health, 11,* 743-750.

Trasande, L., & Chatterjee, S. (2009). The impact of obesity on health service utilization and costs in childhood. *Obesity, 17,* 1749-1754.

United States Department of Health and Human Services (2013). Annual update of the HHS poverty guidelines. *Federal Register, 78,* 5182-5183.

von Bertalanffy, L. (1968). *General Systems Theory*. New York: Braziller.

Waters, E., Doyle, J., Wolfe, R., Wright, M., Wake, M., & Salmon, L. (2000). Influence of parent gender and self-reported health and illness on parent-reported child health. *Pediatrics, 106,* 1422-1428.

Ware, J.E., Kosinski, M., Gandek, B., Sundaram, M., Bjorner, J.B., Turner-Bowker, D.M., & Maruish, M.E. (2010). *User's manual for the SF-12v2 Health Survey* (2nded.). Lincoln, RI: QualityMetric Incorporated.

Ware, J.E., Kosinski, M., & Keller, S.D. (1996). A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity.*Medical Care, 34,* 220-233.

Yoon, D.P., & Lee, E.K.O. (2006). The impact of religiousness, spirituality, and social support on psychological well-being among older adults in rural areas. *Journal of Gerontological Social Work, 48,* 281-298.

Zimet, G. D., Powell, S. S., Farley, G. K., Werkman, S., &Berkoff, K. A. (1990).PsychometricCharacteristics of the Multidimensional Scale of Perceived Social Support.*Journal of Personality Assessment, 55,* 610-617.

Zimmer, K.P., Walker, A.R., & Minkovitz, C.S. (2006). Maternal and child factors affecting high-volume pediatric emergency department use. *Pediatric Emergency Care, 22,* 301-308.

Table 1

Parent Demographics

	% of Total	N
Relationship		
Father	9.09%	8
Mother	87.50%	77
Legal Guardian	3.41%	3
Education		
Grades 9-11 (Some high school)	4.55%	4
Grade 12/GED (High school graduate)	26.14%	23
College 1-3 (some college/technical school)	46.59%	41
College 4 years (College graduate)	14.77%	13
Graduate School (Advanced degree)	7.95%	7
Income		
< 10,000	17.05%	15
10,000-19,999	28.41%	25
20,000-29,999	10.23%	9
30,000-39,999	14.77%	13
40,000-49,999	9.09%	8
50,000-59,999	1.14%	1
60,000-69,999	2.27%	2
70,000-79,999	3.41%	3
80,000-89,999	4.55%	4
90,000-99,999	1.14%	1
100,000-149,999	6.82%	6
No response	1.14%	1
Total Number of Children in Home		
1	38.63%	34
2	32.95%	29
3	15.90%	14
4	10.22%	9
5+	2.27%	2
Parent Insurance		
No health coverage	27.27%	24
Private Insurance	40.91%	36
Medicaid/Other public assistance	31.82%	28
Employment		
Employed Full Time	37.50%	33
Employed - Part Time	18.18%	16
Not Working	44.32%	39
Race/Ethnicity		
Black/African American	15.91%	14
White non-Hispanic	78.41%	69
Other	5.68%	5

Table 2

Child Demographics

	% of Total	N
Child Insurance		
Private Insurance	25.00%	22
Medicaid/Other public assistance	75.00%	66
Child Race/Ethnicity		
African American	15.91%	14
White non-Hispanic	71.59%	63
Other	12.50%	11

Table 3

Child Diagnoses

	N	% of Total
Depression	3	3.41%
Anxiety	9	10.23%
Asthma	49	55.68%
Obesity	10	11.36%
ADHD	15	17.05%
Family Disruption	13	14.77%
GI Complaint	18	20.45%

Table 4.

Acute and Non-Acute Visits

	N	Mean	Std Dev	Min	Max
Acute Visits	88	6.33	5.11	0	29
Non-Acute Visits	88	4.81	4.02	0	27

Table 5

Biopsychosocial Measures

	N	**Mean**	**Std Dev**	**Min**	**Max**
PSAM	87.00	30.92	4.90	13.00	35.00
PHQ-4	87.00	2.49	3.30	0.00	12.00
MSPSS	86.00	71.47	16.49	25.00	84.00
SF-12v2 PCS TOTAL	87.00	49.49	9.76	19.65	62.69
SF-12v2 MCS TOTAL	87.00	50.14	10.41	14.88	74.20
Distress Thermometer	86.00	2.76	2.86	0.00	10.00
Problem List - Practical	87.00	0.60	0.95	0.00	4.00
Problem List - Family	87.00	0.37	0.59	0.00	2.00
Problem List - Emotional	87.00	1.31	1.82	0.00	5.00
Problem List - Spiritual	87.00	0.21	0.51	0.00	2.00
Problem List - Physical	87.00	2.80	3.06	0.00	16.00
Problem List - Total	87.00	5.29	5.68	0.00	26.00

Table 6

Psychosocial Correlations

	1	**2**	**3**	**4**	**5**	**6**	**7**
1. PSAM	1.00	-0.51 (0.0001)*	0.33 (0.0021)*	0.04 (0.6848)	0.53 (0.0001)*	-0.44 (0.0001)*	-0.25 (0.0183)*
2. PHQ-4	-0.51 (0.0001)*	1.00	-0.59 (0.0001)*	-0.27 (0.0114)*	-0.72 (0.0001)*	0.73 (0.0001)*	0.72 (0.0001)*
3. MSPSS	0.33 (0.0021)*	-0.59 (0.0001)*	1.00	0.28 (0.0086)*	0.57 (0.0001)*	-0.58 (0.0001)*	-0.57 (0.0001)*
4. SF-12v2 PCS	0.04 (0.6848)	-0.27 (0.0114)*	0.28 (0.0086)*	1.00	0.12 (0.2529)	-0.16 (0.1518)	-0.46 (0.0001)*
5. SF-12v2 MCS	0.53. (0.0001)*	-0.72 (0.0001)*	0.57 (0.0001)*	0.13 (0.25)	1.00	-0.74 (0.0001)*	-0.65 (0.0001)*
6. Distress Thermometer	-0.44 (0.0001)*	0.73 (0.0001)*	-0.58 (0.0001)*	-0.16 (0.1518)	-0.74 (0.0001)*	1.00	0.60 (0.0001)*
7. Problem List	-0.25 (0.0183)*	0.72 (0.0001)*	-0.57 (0.0001)*	-0.46 (0.0001)	-0.65 (0.0001)*	0.60 (0.0001)*	1.00

Format is Spearman correlation followed by *p*-value

* Indicates significance, $p < 0.05$

Table 7

Psychosocial and Diagnoses

	PSAM	**PHQ-4**	**MSPSS**	**SF12v2 PCS**	**SF12v2 MCS**	**Thermo-meter**	**Problem List**
	Mean (SD)	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Diagnosis - Depression							
Yes	27.33 (3.51)	8.67 (3.51)	49.33 (10.50)	43.08 (9.73)	25.70 (10.10)	7.33 (3.79)	18.33 (7.09)
No	31.05 (4.91)	2.27 (3.09)	72.27 (16.14)	49.72 (9.74)	51.01 (9.35)	2.59 (2.71)	4.82 (5.09)
Diagnosis - Anxiety							
Yes	27.67 (6.00)	5.44 (4.28)	62.78 (23.36)	49.14 (8.47)	41.77 (11.95)	4.75 (3.37)	7.78 (7.61)
No	31.29 (4.66)	2.15 (3.02)	72.48 (15.38)	49.53 (9.95)	51.10 (9.85)	2.55 (2.74)	5.00 (5.41)
Diagnosis - Asthma							
Yes	31.50 (4.16)	2.75 (3.26)	71.53 (17.61)	47.28 (10.44)	49.93 (11.02)	2.96 (2.78)	6.14 (5.99)
No	30.21 (5.66)	2.18 (3.37)	71.38 (15.26)	52.34 (8.07)	50.40 (9.71)	2.50 (2.97)	4.18 (5.13)

Diagnosis - Obesity							
Yes	28.00	6.00	61.00	44.03	40.94	5.10	11.80
	(4.55)	(4.00)	(19.80)	(11.28)	(14.89)	(3.90)	(8.97)
No	31.30	2.04	72.84	50.20	51.33	2.45	4.44
	(4.85)	(2.94)	(15.64)	(9.40)	(9.15)	(2.57)	(4.55)
Diagnosis - ADHD							
Yes	31.07	2.60	67.29	47.32	48.72	2.64	5.20
	(4.13)	(3.29)	(20.41)	(10.34)	(9.06)	(2.82)	(5.41)
No	30.89	2.47	72.28	49.94	50.43	2.78	5.31
	(5.07)	(2.47)	(15.65)	(9.65)	(10.70)	(2.88)	(5.77)
Diagnosis - Family Disruption							
Yes	30.00	4.31	61.15	42.45	44.20	4.17	9.31
	(4.83)	(4.13)	(20.96)	(10.93)	(12.35)	(3.24)	(7.69)
No	31.08	2.18	73.30	50.73	51.18	2.53	4.58
	(4.93)	(3.06)	(15.00)	(9.07)	(9.76)	(2.75)	(4.99)
Problem List - GI Complaint							
Yes	31.78	1.72	78.06	53.36	51.21	2.47	3.33
	(3.41)	(2.32)	(6.72)	(7.49)	(7.25)	(2.32)	(3.48)
No	30.70	2.70	69.84	48.48	49.86	2.83	5.80
	(5.22)	(3.50)	(17.77)	(10.07)	(11.12)	(2.99)	(6.04)

Table 8

Health Care Utilization and Measures – Spearman Correlations

	ED Follow Up	**Telephone**	**Well Checks**	**Acute/Sick**	**IC/MedFT**	**Visits Total**	**Total Minus Acute**
PSAM	-0.05 (0.63)	-0.13 (0.22)	0.03 (0.75)	0.18 (0.09)	0.16 (0.14)	0.12 (0.26)	0.06 (0.57)
PHQ-4	-0.03 (0.77)	-0.01 (0.95)	-0.05 (0.64)	-0.08 (0.43)	0.05 (0.67)	-0.10 (0.34)	-0.08 (0.49)
MSPSS	-0.05 (0.67)	0.02 (0.86)	-0.04 (0.73)	0.07 (0.54)	0.03 (0.80)	0.05 (0.62)	0.05 (0.62)
SF12v2 - PCS	0.08 (0.45)	0.07 (0.50)	0.15 (0.17)	0.11 (0.30)	0.12 (0.26)	0.16 (0.13)	0.18 (0.09)
SF12v2 - MCS	-0.07 (0.53)	0.14 (0.18)	0.10 (0.33)	0.24 (0.0280)*	0.24 (0.0244)*	0.25 (0.0220)*	0.25 (0.0176)*
Thermometer	-0.01 (0.97)	-.008 (0.44)	0.01 (0.91)	-0.22 (0.0450)*	-0.08 (0.45)	-0.21 (0.06)	-0.13 (0.25)
Problem List Total	-0.02 (0.83)	-0.08 (0.43)	-0.02 (0.82)	-0.12 (0.26)	-0.20 (0.06)	-0.18 (0.10)	-0.21 (0.05)

Format is Spearman correlation followed by *p*-value

*****Indicates significance, $p < .05$

Table 9

Health Care Utilization

	Total Visits Minus Acute			Total Acute/Sick Visits		
	N	**Mean**	**Std Dev**	**N**	**Mean**	**Std Dev**
Race/Ethnicity						
Black/African American	14.00	4.07	2.79	14.00	5.07	4.50
White non-Hispanic	69.00	5.03	4.35	69.00	6.54	5.34
Other	5.00	3.80	0.84	5.00	7.00	3.16
Child Insurance						
Private Insurance	22.00	4.36	2.95	22.00	4.86	3.24
Medicaid/Other public assistance	66.00	4.95	4.33	66.00	6.82	5.53
Income						
< 10,000	15.00	4.67	2.09	15.00	8.00	4.81
10,000-19,999	25.00	5.40	4.53	25.00	6.60	5.30
$20,000-49,999	30.00	4.87	5.10	30.00	6.03	5.97
$50,000+	17.00	4.18	2.10	17.00	5.29	3.02
Employment						
Employed Full Time	33.00	4.91	5.18	33.00	6.58	5.97
Employed - Part Time	16.00	4.06	1.61	16.00	6.75	3.62
Not Working	39.00	5.03	3.62	39.00	5.95	4.93
Relationship Status						
Married/Cohabiting	47.00	5.11	4.60	47.00	6.55	5.61
Single/Not Cohabiting	41.00	4.46	3.26	41.00	6.07	4.53
Mental Health Care in Past Year						
Yes	12.00	3.17	1.40	12.00	5.25	2.70
No	76.00	5.07	4.24	76.00	6.50	5.39

Table 10

Initial Poisson Regression Effect Tests – Acute/Sick Visits

	DF	**L-R ChiSquare**	**Prob>ChiSq**
Employment	2	1.65	0.4375
Age - Parents	1	4.01	0.0451*
Child Insurance	1	1.02	0.3126
Diagnosis - Depression	1	0.89	0.3442
Diagnosis - Anxiety	1	3.43	0.0639
Diagnosis - Asthma	1	7.81	0.0052*
Diagnosis - Obesity	1	5.18	0.0228*
Diagnosis - ADHD	1	4.95	0.0260*
Diagnosis - Family Disruption	1	2.33	0.1267
Diagnosis - GI Complaint	1	2.71	0.1000
SF12v2- PCS TOTAL	1	6.60	0.0102*
SF12v2- MCS TOTAL	1	9.02	0.0027*
Distress Thermometer	1	1.46	0.2262
Race/Ethnicity - Parents	2	10.04	0.0066*

*Indicates significance, $p < 0.05$

Table 11

Final Acute/Sick Poisson Regression Model – Effect Tests

	DF	L-R ChiSquare	Prob>ChiSq
Age - Parents	1	7.62	0.0058*
Diagnosis - Anxiety	1	4.36	0.0368*
Diagnosis - Asthma	1	7.18	0.0074*
Diagnosis - Obesity	1	4.30	0.0381*
SF12v2 – PCS	1	8.14	0.0043*
SF12v2 – MCS	1	10.34	0.0013*
Race/Ethnicity - Parents	2	7.99	0.0184*

*Indicates significance, $p < 0.05$

Table 12

Final Acute/Sick Poisson Regression Model – Parameter Estimates

	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq
Intercept	0.25	0.65	0.15	0.70
Age - Parents	-0.02	0.01	7.62	0.0058*
Diagnosis - Anxiety [Yes]	0.23	0.11	4.36	0.0368*
Diagnosis - Asthma [Yes]	0.22	0.08	7.18	0.0074*
Diagnosis - Obesity [Yes]	0.25	0.11	4.30	0.0381*
SF12v2 – PCS	0.02	0.01	8.14	0.0043*
SF12v2 – MCS	0.03	0.01	10.34	0.0013*
Race/Ethnicity – Parents [Black/African American]	-0.34	0.18	3.41	0.0649
Race/Ethnicity – Parents [White non-Hispanic]	0.27	0.15	3.46	0.0630

*Indicates significance, $p < .05$

Table 13

Initial Poisson Regression Effect Tests – Non Acute Visits

	DF	**L-R ChiSquare**	**Prob>ChiSq**
Employment	2	0.80	0.6691
Age - Parents	1	1.18	0.2773
Child Insurance	1	0.60	0.4385
Diagnosis - Depression	1	0.02	0.8837
Diagnosis - Anxiety	1	8.24	0.0041*
Diagnosis - Asthma	1	3.93	0.0473*
Diagnosis - Obesity	1	0.41	0.5237
Diagnosis - ADHD	1	0.00	0.9848
Diagnosis - Family Disruption	1	3.56	0.0593
Diagnosis - GI Complaint	1	0.77	0.3797
SF12v2- PCS TOTAL	1	5.84	0.0157*
SF12v2- MCS TOTAL	1	11.84	0.0006*
Distress Thermometer	1	6.20	0.0128*
Race/Ethnicity - Parents	2	3.81	0.1488

*Indicates significance, $p < 0.05$

Table 14

Final Non-Acute Poisson Regression Model – Effect Tests

	DF	**L-R ChiSquare**	**Prob>ChiSq**
Diagnosis - Anxiety	1	8.46	0.0036*
SF12v2- MCS	1	5.89	0.0152*

*Indicates significance, *p* < 0.05

Table 15

Final Non-Acute Poisson Regression Model – Parameter Estimates

	Estimate	**Std Error**	**L-R ChiSquare**	**Prob>ChiSq**
Intercept	0.77	0.45	2.68	0.1014
Diagnosis - Anxiety [Yes]	0.37	0.12	8.46	0.0036*
SF12v2- MCS	0.02	0.01	5.89	0.0152*

*Indicates significance, *p* <0 .05

CHAPTER SIX: RURAL PEDIATRIC PRIMARY CARE: IMPLICATIONS AND RECOMMENDATIONS

While nearly half of pediatric office visits are made to address children's behavioral, psychosocial, or educational issues, in addition to physical complaints (Connor et al., 2006), it is well-documented that parental psychosocial factors such as stress (Janicke & Finney, 2003) and depression (Flynn, Davis, Marcus, Cunningham & Blow, 2004) can also influence pediatric primary care visits. As excessive utilization can lead to unnecessary health care costs, it is vital to address both pediatric biopsychosocial (BPS; Engel, 1977, 1980) issues and parental/family BPS issues in the pediatric primary care setting (National Alliance on Mental Illness, 2011), especially in rural, under-served areas (Polaha, Dalton, & Allen, 2011) as there are higher levels of mental health concerns, yet fewer resources available (Smalley et al., 2010) as compared to more urban populations. The purpose of this chapter is to review the findings of the previous articles in the dissertation regarding rural pediatric primary care, and provide clinical, research, and policy recommendations based on these findings.

Chapters two and five include findings from which two general statements can be made. First, there is a large gap in the research regarding empirically-based brief interventions for children in pediatric primary care, particularly in rural areas. Though the systematic review in chapter two revealed several publications that provided suggestions for integrating behavioral and medical care with children (e.g., Erickson, Gerstle, & Feldstein, 2005; Kolko, Campo, Kelleher, & Cheng, 2010), few of these publications were empirically based (e.g., Connor et al., 2006; Husky, Miller, McGuire, Flynn, & Olfson, 2010), and fewer were empirically based *and* brief in nature (e.g., Finney, Lemanek, Cataldo, Katz, & Fuqua, 1989; Turner & Sanders, 2006). No publications were found that focused on brief, integrated care interventions specific to rural populations in the United States. As also evidenced in the review, there is a need for studies focusing on behavioral health interventions in pediatric primary care that include a systemic component, as only a small amount of researchers have studied the relationship between integrated care and its impact on children's biomedical and psychosocial health (Celano, 2006; Finney, Riley & Cataldo, 1991; Kramer & Garralda, 2000) or have examined the influence of parenting practices and parental satisfaction (Minkovitz et al., 2003) on child healthcare utilization.

Second, as evidenced in the second article, parental BPS characteristics do have an influence on child health care utilization in rural areas, when incorporated with demographic variables and previous child diagnoses. This was discovered via a descriptive, cross-sectional study that was done to investigate the influence of parental BPS characteristics on child health care utilization, conducted in a rural southeastern community health clinic that cares for a large pediatric population. Through the use of Poisson regression modeling, an interaction was found between lower age of parents, parental physical and mental quality of life, parental race/ethnicity, and child diagnoses of asthma, obesity, and anxiety on acute child health care utilization. Although researchers have found among non-rural samples that *decreased* parental mental health well-being lead to an increase in acute visits (Janicke, Finney & Riley, 2001; Minkovitz et al., 2005), the findings of the study in this dissertation were the opposite; *increased* parental mental well-being was related to increased acute visits when part of the Poisson regression model. However, the interaction between parental mental health quality of life and a diagnosis of anxiety for the child were indicative of increased non-acute visits.

The relationship between increased parental mental health and non-acute visits is supported by other researchers; parents with better mental health were more likely to have children with routine preventative care visits (e.g., Holland et al., 2012; Janicke et al., 2001). Pediatric anxiety has also been found in the literature to be associated with increased health care utilization (Ramsawh, Chavira, & Stein, 2010). It appears that parents with better mental health may be more capable of tending to their child's health care needs, needs that may increase if the child has a diagnosis of anxiety, based on the findings from article two in this dissertation.

The results of the two articles included in this dissertation suggest a need to understand more about systemic influences on child care utilization in rural areas (article two), and create brief interventions to address BPS issues that arise in pediatric primary care (article one). Given the findings of these articles, several implications for clinicians, researchers, policy makers are provided. Specific implications are also offered for Medical Family Therapists (MedFTs) whose training and theoretical approach could help to address some of the needs highlighted below.

Clinical Implications

As evidenced by the findings in article two, parent BPS characteristics, along with child diagnoses (e.g., asthma, obesity, anxiety) interact to impact acute/sick health care utilization. For behavioral health clinicians working in rural pediatric primary care, it is essential to routinely assess not only for the child's BPS concerns, but for parental concerns as well. Becoming aware of the needs of the entire family may help to reduce or eliminate unnecessary utilization and positively influence the child's well-being (Garg, Marino, Vikani, & Solomon, 2012).

Second, behavioral health clinicians must incorporate multiple systems while intervening on child BPS concerns. Involving parents, caregivers, and other family members in the intervention process may be advantageous to the clinician and the families, as we know families function systemically (Broderick & Smith, 1979) and members are impacted by one another. As such, policy changes are needed to allow providers to ethically address systemic issues, and get reimbursed for it. This systemic work may occasionally call for clinicians to work individually with parents on their own issues (e.g., anxiety, depression) that can impact the child. To fit in with the model of integrated primary care, these interventions must be brief and patient/family-centered per the findings from article one.

Finally, clinicians must be consumers of research to ensure the best treatments for patients and their families, particularly when working in a fairly new area of research such as pediatric integrated primary care. The literature supports that there are unique health disparities in rural areas (e.g., Hortz, Stevens, Holden & Petosa, 2009; Polaha et al., 2011), and clinicians must be aware of these differences to appropriately treat children and their families. Utilizing empirically-supported interventions suitable for rural populations to help address child and parent BPS issues may help to reduce unnecessary utilization, thus eliminating superfluous health care costs.

Research Implications

As previously stated, there is a dire need for research to take place with rural pediatric populations. First, more exploratory research must be done to understand more about the many systems that influence pediatric primary care. An increased understanding of how the different systems interact (i.e., parent subsystem, child subsystem, and health care system) may guide researchers to needs that are not being met and the interventions necessary in rural pediatric primary care. Correlational research might be useful in determining factors that contribute to child health and well-being in rural areas.

The second article of this dissertation began the conversation on the research question, “Does parent/caretaker psychosocial health influence child health care utilization in rural populations?” However, this was the first of its kind in a rural area and additional studies are needed to confirm the results, as it has been well-established in the literature that children in rural areas are more likely to have a sedentary lifestyle (Hortz et al., 2009), higher incidences of asthma (Ernst & Cormier, 2000), and have parents with high rates of psychosocial problems (Polaha et al., 2011). More research is needed to identify the unique needs of the rural pediatric population, and how clinicians in integrated primary care can provide psychosocial and mental health support to these children and their families.

Second, as identified by a lack of research available via the systematic review in this dissertation, interventions must be formulated to target the issues identified in the exploratory research process. These interventions should be brief, systemic, and integrated (Miller, Kessler, Peek, & Kallenberg, 2011) to fit the needs of primary care setting (Cully, 2012). The efficacy of the interventions should be established using a control group, randomized controlled trial (or equivalent design) (Lyness, Walsh & Sprenkle, 2005). A sample research question might be, "Does the implementation of 'Intervention X' on the pediatric patient reduce Y symptoms from the patient as compared to usual care?" Research targeted toward a single intervention may be more beneficial initially until empirical evidence for individual interventions has been established.

The findings from article one and article two in this dissertation lead to a need for a final area of research; research focused on the effectiveness of interventions in "real-world" clinical settings. As with efficacy trials discussed above, careful attention should be paid to the fidelity of the interventions to assure consistency across providers. Patient characteristics (e.g., age, ethnicity, special health needs [such as chronic illness]) should also be clearly reported for the purposes of generalizability and insight into the rural populations. Researchers may also incorporate mixed-methods research for further understanding of the merits and drawbacks of interventions not only from patients and their families, but also from medical providers and the medical system.

Policy Implications

With the implementation of the Patient Protection and Affordable Care Act (PPACA), there has been an increased push toward integrating mental and behavioral health care into primary care settings, and incentives have been presented to mental/behavioral health providers to work in rural/under-served areas with children (National Council for Community Behavioral Healthcare, 2010), as there not enough mental health care providers to meet the needs of rural citizens (Gamm, Stone, & Pittman, 2010; Smalley et al., 2010). However, federal and state legislation and policy continues to carve out several mental health disciplines from participating in serving the needs of portions of our population. Policy changes are needed to help ensure that there are enough mental health providers available to cover the needs in all communities, especially the rural areas where professional workforce recruitment may be more difficult. Policy changes are also needed to support the development of medical homes and other integrated care facilities to address BPS issues for patients and their families.

Article one of this dissertation identified challenges that providers face when intervention is needed but there are relatively few to no empirically supported brief integrated interventions to address mental/behavioral health concerns and that are culturally relevant to rural populations. The gaps identified in article one must be addressed in order to fulfill the agenda put forth by the PPACA, in which members of Congress mandated interdisciplinary community health teams to improve quality of care and attend to the disparities experienced by rural/under-served populations (Bolin, Gamm, Vest, Edwardson, & Miller, 2011). The needs of rural/under-served populations cannot be properly addressed without empirically-supported, culturally-relevant interventions available to provide guidance to the interdisciplinary community health teams. As such, it is necessary that major federal agencies (e.g., National Institute for Mental Health, Center for Medicare/Medicare Services; Health Resources and Services Administration) fund research to examine these issues. Those who are involved in integrated primary care in rural areas (e.g., medical providers, behavioral health clinicians) must advocate for these issues through their own professional organizations (e.g., American Medical Association, American Association for Marriage and Family Therapy, American Nurses Association) and through interdisciplinary organizations (e.g., Collaborative Family Healthcare Association, National Council for Community Behavioral Healthcare) to gain support and bring these issues to the national level.

The findings of article two identified a relationship between the parent-child subsystems and the subsequent influence on the health care system. As we continue to understand more about how larger systems (e.g., parents/families) influence the health and health care utilization of pediatric patients, it is necessary that policy is created to support family-centered interventions. For example, clinicians must be able to be reimbursed for work done with children and their parents/families. Addressing systemic needs may not only be advantageous to the patient, but also to the health care system as unnecessary costs are reduced by eliminating unnecessary health care utilization.

Medical Family Therapy Implications

Two major tenets function as the foundation for medical family therapy – agency and communion (Doherty, McDaniel, & Hepworth, 1994). Agency refers to one’s involvement and commitment to his or her own health care, and the ability to make choices about personal health (Doherty et al., 1994). Communion is the sense of connection to medical professionals, staff, friends, and family; one who has communion feels loved and cared for by those they seek support from (Doherty et al., 1994). MedFTs must be familiar with the role that illness plays in families, and understand the medical system in order to work with staff and providers for integrated care of the patients (Ruddy & McDaniel, 2003) while applying the biopsychosocial (BPS) model (Engel, 1977, 1980; Tyndall, Hodgson, Lamson, Knight, & White, 2010). Doctoral level MedFTs are expected to conduct research to further the field and establish efficacy and effectiveness of integrated care, as well as teach a variety of different audiences (e.g., health care providers, mental health providers, child and family studies students) about issues such as collaboration and the BPS model (Tyndall et al., 2010).

The findings from this dissertation and subsequent implications discussed in this chapter meet the skill sets and match the abilities of those who are trained to do MedFT. Clinically, MedFTs are trained to assess situations systemically, going beyond family systems and incorporating other systems, such as medical providers and other entities (e.g., school, spiritual leaders). Working with children and their families systemically may help to address the concerns that were found in article two to influence health care utilization, reducing costs and increasing patient and family well-being. In addition, overwhelmed medical providers may notice relief as MedFTs, trained to work with individuals, couples, and families, are available to discuss family dynamics and pediatric BPS needs that tend to be time-consuming in clinics.

The systemic training, coupled with research skills prepare doctoral-level MedFTs to conduct the research that is needed to develop empirically based integrated care brief intervention models for use in rural pediatric practices. Doctoral-level MedFTs are familiar with conducting studies and interventions with couple and family units, and can use this knowledge and experience, coupled with systemic training, to design and implement the types of research recommended above. Additionally, MedFTs are trained to be culturally knowledgeable and sensitive, traits that are necessary in conducting research for rural and under-served populations.

Finally, MedFTs are trained to stay abreast on policies such as the PPACA and how it impacts patients, families, the health care system. Additionally, understanding policy issues such as reimbursement will help MedFTs to innovate sustainable models when working in clinics with patients and their families (e.g., billing for different subgroups). Having knowledge of current policies impacting integrated care, barriers to reimbursement, along with understanding the needs of rural families in primary care (e.g., brief interventions addressing asthma, anxiety, parental stress) will allow MedFTs to appropriately lobby for change as needed for underserved rural populations.

Conclusion

The articles in this dissertation indicate a need for behavioral health clinicians (e.g., MedFTs) to focus on children *and* their parents in primary care settings in order to reduce unnecessary health care utilization, and develop empirically-based, brief interventions targeting BPS issues for children in rural primary care settings. Several recommendations were made in this chapter for behavioral health clinicians, researchers, and policy makers based on the findings from the dissertation. Additionally, the basic tenets and roles of MedFTs are introduced, along with a brief discussion on how the dissertation findings fit with the MedFT specialization.

As research findings (such as those presented in this dissertation) are used to strength the need for empirically-based interventions addressing the BPS concerns of children and their families in rural areas, several steps need to be taken. First, clinicians (both medical and behavioral health) working with rural populations must begin to advocate for the needs of these communities, both within their professional organizations and at a national level for grant funding to begin addressing these concerns. Next, behavioral health researchers and other experts in integrated care (e.g., MedFTs) must acquire grant funding in order to develop treatments that are a) empirically supported, b) systemic, c) effective, d) efficacious, and e) appropriate for use in integrated pediatric primary care settings (e.g., brief). Finally, clinicians, researchers, and policy makers must work together to carry out the aforementioned interventions in rural pediatric primary care settings in order to put research into practice.

REFERENCES

Bolin, J.N., Gamm, L., Vest, J.R., Edwardson, N., Miller, T.R., (2011). Patient-centered medical homes: Will health care reform provide new options for rural communities and providers? *Family Community Health, 34,* 93-101.

Broderick, C.B., & Smith, J. (1979). The general systems approach to the family. In W.R. Burr, R. Hill, F.I. Nye., & I.L. Reiss (Eds.), *Contemporary Theories about the Family* (pp. 112-129). New York: Free Press.

Celano, M.P. (2006). Family processing in pediatric asthma. *Current Opinion in Pediatrics, 18,* 539-544.

Connor, D.F., McLaughlin, T.J., Jeffers-Terry, M., O'Brien, W., Stille, C.J., Young, L.M., & Antonelli, R.C. (2006). Targeted child psychiatric services: A new model of pediatric primary clinician-child psychiatry collaborative care. *Clinical Pediatrics, 45,* 423-434.

Cully, J.A., Armento, M.E.A., Mott, J., Nadorff, M.R., Naik, A.D., Stanley, M.A., Sorocco, K.H., Kunik, M.E., Peterson, N.J., & Kauth, M.R. (2012). Brief cognitive behavioral therapy in primary care: A hybrid type 2 patient-randomized effectiveness-implementation design. *Implementation Science, 7,* 64 – 76.

Doherty, W. J., McDaniel, S. H., & Hepworth, J. (1994). MedFT: an emerging arena for family therapy. *Journal of Family Therapy, 16,* 31-46.

Engel, G. L. (1977). The need for a new medical model: a challenge for biomedicine. *Science, 196,* 129–136.

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry, 137,* 535-544.

Erickson, S.J., Gerstle, M., & Feldstein, S. W. (2005). Brief interventions and motivational interviewing with children, adolescents, and their parents in pediatric health care settings. *Archives of Pediatric and Adolescent Medicine, 159,* 1173-1180.

Ernst, P., & Cormier, Y. (2000). Relative scarcity of asthma and atopy among rural adolescents raised on a farm. *American Journal of Respiratory Critical Care Medicine, 161,* 1563-1566.

Finney, J. W., Lemanek, K.L., Cataldo, M.F., Katz, H.P., & Fuqua, R. W. (1989). Pediatric psychology in primary health care: Brief targeted therapy for recurrent abdominal pain. *Behavioral Therapy, 20,* 283-291.

Finney, J.W., Riley, A.W., & Cataldo, M.F. (1991). Psychology in primary health care: Effects of brief targeted therapy on children's medical care utilization. *Journal of Pediatric Psychology, -16,* 447-461.

Flynn, H.A., Davis, M., Marcus, S.M., Cunningham, R., & Blow, F.C. (2004). Rates of maternal depression in pediatric emergency department and relationship to child service utilization. *General Hospital Psychiatry, 26,* 316-322.

Gamm, L., Stone, S., & Pittman, S. (2010). Mental health and mental disorders – A rural challenge: A literature review. *Rural Healthy People,* 97-113.

Garg, A., Marino, M., Vikani, A.R., & Solomon, B.S. (2012). Addressing families' unmet social needs within pediatric primary care: The health leads model. *Clinical Pediatrics, 51,* 1191-1193.

Holland, M.L., Yoo, B.K., Kitzman, H., Chaudron, L., Szilagyi, P.G., Temkin-Greener, H. (2012). Mother-child interactions and the associations with child health care utilization in low-income urban families. *Maternal and Child Health Journal, 16,* 83-91.

Hortz, B., Stevens, E., Holden, B., & Petosa, R.L. (2009). Rates of physical activity among Appalachian adolescents in Ohio. *The Journal of Rural Health, 25,* 58-61.

Husky, M.M., Miller, K., McGuire, L., Flynn, L., &Olfson, M. (2010). Mental health screening of adolescents in pediatric practice. *Journal of Behavioral Health Services & Research, 38,* 159-169.

Janicke, D. M., & Finney, J. W. (2003). Children's primary health care services: Social-cognitivefactors related to utilization. *Journal of Pediatric Psychology, 28,* 547-558.

Janicke, D.M., Finney, J.W., & Riley, A.W. (2001). Children's health care use: A prospective investigation of factors related to care-seeking. *Medical Care, 39,* 990-1001.

Kolko, D.J., Campo, J.V., Kelleher, K. & Cheng, Y. (2010). Improving access to care and clinical outcome for pediatric behavioral problems: A randomized trial of a nurse-administered intervention in primary care. *Journal of Developmental & Behavioral Pediatrics, 31,* 393-404.

Kramer, T., & Garralda, M.E. (2000). Child and adolescent mental health problems in primary care. *Journal of Continuing Professional Development, 6,* 287-294.

Lyness, K. P., Walsh, S. R., & Sprenkle, D. H. (2004). Clinical trials in marriage and family therapy research. In D. H. Sprenkle & F. P. Piercy (Eds.) *Research Methods in Family Therapy* (pp. 297 – 317). New York: Guildford Press.

Miller, B.F., Kessler, R., Peek, C.J., & Kallenberg, G.A. (2011). *A national agenda for research in collaborative care: Establishing the research agenda for collaborative care*. (AHRQ Publication No. 11-0067). Agency for Healthcare Research and Quality: Rockville, MD. Retrieved from: http://www.ahrq.gov/research/collaborativecare/collab1.htm

Minkovitz, C.S., Hughart, N., Strobino, D., Scharfstein, D., Grason, H., Hou, W., Miller, T., Bishai, D., Augustyn, M., McLearn, K.T., &Guyer, B. (2003). A practice-based intervention to enhance quality of care in the first 3 years of life: The healthy steps for young children program. *Journal of the American Medical Association, 290,* 3081-3091.

Minkovitz, C.S., Strobino, D., Scharfstein, D., Hou, W., Miller, T., Mistry, K.B., & Swartz, K. (2005). Maternal depressive symptoms and children's receipt of health care in the first 3 years of life. *Pediatrics, 115,* 306-314. .

National Alliance on Mental Illness (2011). A family guide: Integrating mental health and pediatric primary care. Retrieved from: http://www.nami.org/Content/ContentGroups/CAAC/FG-Integrating.pdf

National Council for Community Behavioral Healthcare (2010). Summary of the major provisions in the patient protection and affordable health care act. Retrieved from: http://www.thenationalcouncil.org/galleries/policy-file/HCR%20Summary%20Chart%20Updated%20with%20Approps%20Info%2010-22-10.pdf

Polaha, J., Dalton, W.T., & Allen, S. (2011). The prevalence of emotional and behavioral problems in pediatric primary care serving rural children. *Journal of Pediatric Psychology, 36,* 652-660.

Ramsawh, H.J., Chavira, D.A., & Stein, M. B. (2010). Burden of anxiety disorders in pediatric medical settings: Prevalence, phenomenology, and a research agenda. *Archives of Pediatric and Adolescent Medicine, 164,* 965-972.

Ruddy, N. B. & McDaniel, S. H. (2003). MedFT. In *Handbook of Family Therapy: The Science and Practice of Working with Families and Couples.*

Smalley, K. B., Yancey, C. T., Warren, J. C., Naufel, K., Ryan, R., & Pugh, J. L. (2010). Rural mental health and psychological treatment: A review for practitioners. *Journal of Clinical Psychology*, *66*(5), 479-489.

Turner, K. M.T., & Sanders, M. R. (2006). Help when it's needed first: A controlled evaluation of brief, preventive behavioral family intervention in a primary care setting. *Behavior Therapy, 37,* 131-142.

Tyndall, L., Hodgson, J., Lamson, A., Knight, S., & White, M. (2010). *Operationalizing medical family therapy: Building a case for consensus.* (Unpublished doctoral dissertation). East Carolina University, Greenville, NC.

APPENDIX A: SURVEY

Demographic Information

Please complete the following questionnaire. Check all that apply and/or fill in the blank.

1. What is your gender?
    - ☐ Female
    - ☐ Male

2. What is your relationship to the child you brought to the clinic today?
    - ☐ Father
    - ☐ Mother
    - ☐ Legal Guardian
    - ☐ Other (please explain) ________________________

3. In what year were you born? ___________

4. How do you describe yourself?
    - ☐ American Indian or Alaska Native
    - ☐ Hawaiian or Other Pacific Islander
    - ☐ Asian or Asian American
    - ☐ Black or African American
    - ☐ Hispanic or Latino
    - ☐ White non-Hispanic
    - ☐ Other (please explain) _________________________

5. How old is the child you have brought in to the clinic today? __________

6. How would you describe your child?
    - ☐ American Indian or Alaska Native
    - ☐ Hawaiian or Other Pacific Islander
    - ☐ Asian or Asian American
    - ☐ Black or African American
    - ☐ Hispanic or Latino
    - ☐ White non-Hispanic
    - ☐ Other (please explain) _________________________

7. How many children live in your household who are:
   - ☐ Less than 5 years old? ________
   - ☐ 5 through 12 years old? _______
   - ☐ 13 through 17 years old? ______

8. Are you currently:
   - ☐ Married
     - i. If so, how many times? _____
   - ☐ Divorced
   - ☐ Widowed
   - ☐ Separated
   - ☐ Never been married
   - ☐ A member of an unmarried couple, living together
   - ☐ A member of an unmarried couple, not living together

9. What is the highest grade or year of school you completed?
   - ☐ Never attended school or only attended kindergarten
   - ☐ Grades 1 through 8 (Elementary)
   - ☐ Grades 9 through 11 (Some high school)
   - ☐ Grade 12 or GED (High school graduate)
   - ☐ College 1 year to 3 years (Some college or technical school)
   - ☐ College 4 years (College Graduate)
   - ☐ Graduate School (Advanced Degree)

10. Are you currently: (please choose one)
   - ☐ Employed for wages – full time
   - ☐ Employed for wages – part time
   - ☐ Self-employed
   - ☐ Out of work for more than 1 year
   - ☐ Out of work for less than 1 year
   - ☐ A homemaker
   - ☐ A student
   - ☐ Retired
   - ☐ Unable to work

11. What is your total yearly household income?

☐ Less than $10,000
☐ $10,000 to $19,999
☐ $20,000 to $29,999
☐ $30,000 to $39,999
☐ $40,000 to $49,999
☐ $50,000 to $59,999
☐ $60,000 to $69,999
☐ $70,000 to $79,999
☐ $80,000 to $89,999
☐ $90,000 to $99,999
☐ $100,000 to $149,999
☐ $150,000 or more

12. What type of health insurance do you have for yourself?
    ☐ No health coverage
    ☐ Private Insurance (i.e., Blue Cross/Blue Shield)
    ☐ Medicaid/Other Public Assistance
    ☐ Other (please indicate) ___________________

13. What type of health insurance does your child have?
    ☐ No health coverage
    ☐ Private Insurance (i.e., Blue Cross/Blue Shield)
    ☐ Medicaid/Other Public Assistance
    ☐ Other (please indicate) __________________

14. Please list all of your medical and mental health diagnoses that you are ***currently*** being treated for.

    ☐ ___________________________
    ☐ ___________________________
    ☐ ___________________________
    ☐ ___________________________
    ☐ ___________________________
    ☐ ___________________________
    ☐ ___________________________

15. Please list all of your ***current*** medications/prescriptions.

- ☐ ___________________________
- ☐ ___________________________
- ☐ ___________________________
- ☐ ___________________________
- ☐ ___________________________
- ☐ ___________________________
- ☐ ___________________________
- ☐ ___________________________

16. Have you accessed mental health care in the past year?

- ☐ Yes *(If yes, continue to the next question)*
- ☐ No *(If no, skip to Question 19)*

17. Was your mental health professional a:

- ☐ Counselor
- ☐ Marriage and Family Therapist
- ☐ Psychologist
- ☐ Psychiatrist
- ☐ I don't know
- ☐ Other (please indicate) _________________

18. How helpful would you describe the mental health care you received?

- ☐ Very helpful
- ☐ Moderately helpful
- ☐ Neither helpful nor unhelpful
- ☐ Moderately unhelpful
- ☐ Very unhelpful

Emergent Health Care Utilization Section

19. To your knowledge, how many times has **<u>your child</u>** been to an urgent-care clinic, or the emergency room? ___________________
    - ☐ How many of these visits have been in the last two years? __________________

20. To your knowledge, how many times have **<u>you</u>**, the parent/guardian, been to an urgent-care clinic, or the emergency room? ___________________
    - ☐ How many of these visits have been in the last two years? ___________________

Parenting Section

21. Please indicate with an X in the box, on a scale of 1 (rarely) to 7 (always) how true these statements are regarding your role as a parent.

	1 (rarely)	**2**	**3**	**4**	**5**	**6**	**7 (always)**
a. I feel sure of myself as a mother/father/guardian							
b. I know I am doing a good job as a mother/father/guardian							
c. I know things about being a mother/father/guardian that would be helpful to other parents							
d. I can solve most problems between my child and me							
e. When things are going badly with my child and me, I keep trying until things begin to change							

Emotional Health Section

22. Please indicate with an X in the box how often, over the last two weeks, you been bothered by the following problems:

	Not at All	**Several Days**	**More than Half the Days**	**Nearly Every Day**
a. Feeling nervous, anxious, or on edge				
b. Not being able to stop or control worrying				
c. Little interest or pleasure in doing things				
d. Feeling down, depressed, or hopeless				

Social Support Section

23. Please indicate with an X in the box how true the following statements feel to you:

	1 Very Strongly Disagree	**2**	**3**	**4**	**5**	**6**	**7 Very Strongly Agree**
a. There is a special person around when I am in need.							
b. There is a special person with whom I can share my joys and sorrows.							
c. My family really tries to help me.							
d. I get the emotional help and support I need from my family.							
e. I have a special person who is a real source of comfort for me.							
f. My friends really try to help me.							
g. I can count on my friends when things go wrong.							
h. I can talk about my problems with my family.							

	1 **Very Strongly Disagree**	**2**	**3**	**4**	**5**	**6**	**7** **Very Strongly Agree**
i. I have friends with whom I can share my joys and sorrows.							
j. There is a special person in my life who cares about my feelings.							
k. My family is willing to help my make decisions.							
l. I can talk about my problems with my friends.							

Quality of Life Section

For each of the following questions, please check the one box that best describes your answer.

24. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
▼	▼	▼	▼	▼
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

25. The following questions are about activities you might do during a typical day. Does <u>your health now limit you</u> in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
	▼	▼	▼
a <u>Moderate activities</u>, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐ 1	☐ 2	☐ 3
b Climbing <u>several</u> flights of stairs	☐ 1	☐ 2	☐ 3

26. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of your physical health</u>?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	▼	▼	▼	▼	▼
a <u>Accomplished less</u> than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Were limited in the <u>kind</u> of work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

27. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	All of the time ▼	Most of the time ▼	Some of the time ▼	A little of the time ▼	None of the time ▼
a Accomplished less than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Did work or other activities less carefully than usual	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

28. During the past four weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all ▼	A little bit ▼	Moderately ▼	Quite a bit ▼	Extremely ▼
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

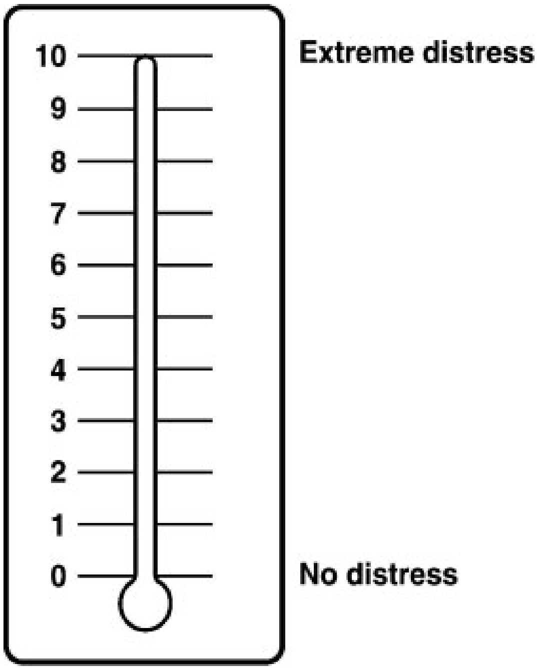
29. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks…

	All of the time ▼	Most of the time ▼	Some of the time ▼	A little of the time ▼	None of the time ▼
a Have you felt calm and peaceful?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b Did you have a lot of energy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c Have you felt downhearted and depressed?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

30. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
▼	▼	▼	▼	▼
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

31. Please circle the number (0-10) that best describes how much distress you have been experiencing in the past week including today:



32. **Please indicate if any of the following has been a problem for you in the past week including today by placing a check mark for YES or NO.**

YES	**NO**	**Practical Problems**
		Housing
		Insurance
		Work/School
		Transportation
		Child Care

YES	**NO**	**Family Problems**
		Dealing with partner
		Dealing with children

YES	**NO**	**Emotional Problems**
		Worry
		Fears
		Sadness
		Depression
		Nervousness

YES	**NO**	**Spiritual/Religious Concerns**
		Relating to God
		Loss of Faith

YES	**NO**	**Physical Problems**
		Pain
		Nausea
		Fatigue
		Sleep
		Getting Around
		Bathing/dressing
		Breathing
		Mouth sores
		Eating
		Indigestion
		Constipation
		Diarrhea
		Changes in urination
		Fevers
		Skin dry/itchy
		Nose dry/congested
		Tingling in hands/feet
		Feeling swollen
		Sexual

APPENDIX B: IRB APPROVAL

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Initial Approval: Expedited

From: Biomedical IRB
To: Christine Borst
CC: Jennifer Hodgson
Date: 12/13/2012
Re: UMCIRB 12-001791
Influences on Rural Child Health Care Utilization

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) is for the period of 12/13/2012 to 12/12/2013. The research study is eligible for review under expedited category #5 & #7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

The approval includes the following items:

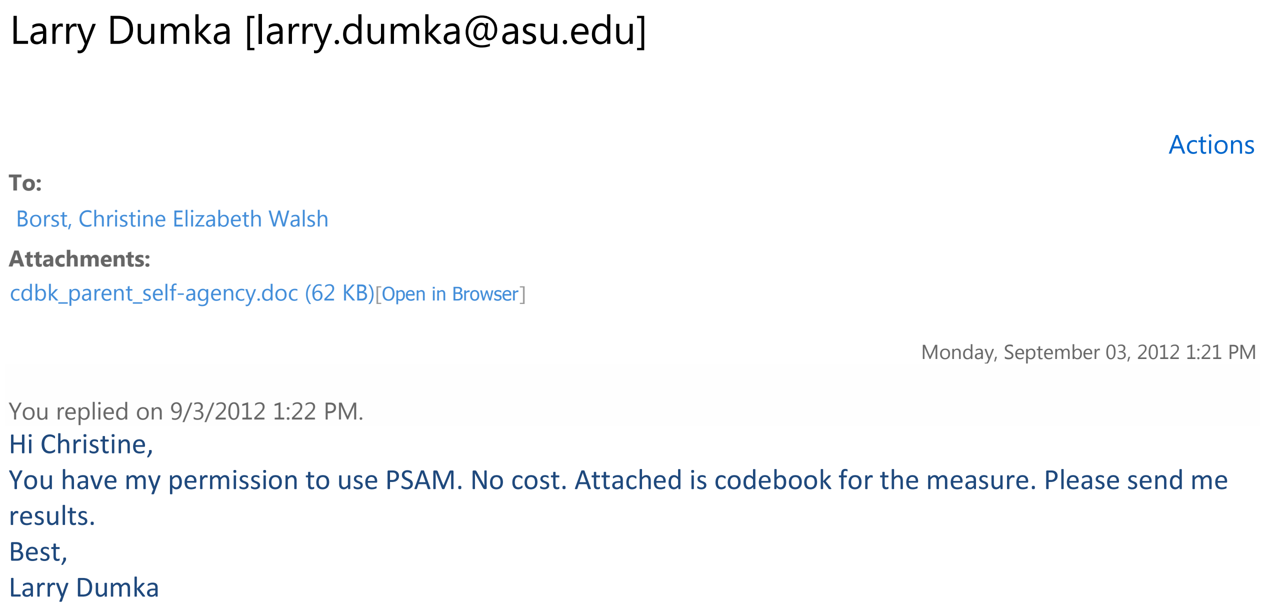
Name	Description
Borst - Informed Consent No More Than Minimal Risk | History	Consent Forms
Borst - Minor Assent | History	Consent Forms
Borst Assent Script | History	Consent Forms
Borst Dissertation Proposal | History	Study Protocol or Grant Application
Borst Final Survey | History	Surveys and Questionnaires
Greene County Health Care Permission Letter | History	Retrospective Analysis Data Approval/Permission
HIPAA Authorization | History	HIPAA Authorization

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418 IRB00004973

APPENDIX C: PERMISSIONS TO USE MEASURES

PERMISSION TO USE PSAM



Larry Dumka [larry.dumka@asu.edu]

To:
Borst, Christine Elizabeth Walsh

Attachments:
cdbk_parent_self-agency.doc (62 KB)[Open in Browser]

Monday, September 03, 2012 1:21 PM

You replied on 9/3/2012 1:22 PM.

Hi Christine,
You have my permission to use PSAM. No cost. Attached is codebook for the measure. Please send me results.
Best,
Larry Dumka

PERMISSION TO USE PHQ-4

Welcome to the
Patient Health Questionnaire (PHQ) Screeners

Screener Overview

Recognizing signs of mental health disorders is not always easy. The Patient Health Questionnaire (PHQ) is a diagnostic tool for mental health disorders used by health care professionals that is quick and easy for patients to complete. In the mid-1990s, Robert L. Spitzer, MD, Janet B.W. Williams, DSW, and Kurt Kroenke, MD, and colleagues at Columbia University developed the Primary Care Evaluation of Mental Disorders (PRIME-MD), a diagnostic tool containing modules on 12 different mental health disorders. They worked in collaboration with researchers at the Regenstrief Institute at Indiana University and with the support of an educational grant from Pfizer Inc. **During the development of PRIME-MD, Drs. Spitzer, Williams and Kroenke, created the PHQ and GAD-7 screeners.**

The PHQ, a self-administered version of the PRIME-MD, contains the mood (PHQ-9), anxiety, alcohol, eating, and somatoform modules as covered in the original PRIME-MD. The GAD-7 was subsequently developed as a brief scale for anxiety. The PHQ-9, a tool specific to depression, simply scores each of the 9 DSM-IV criteria based on the mood module from the original PRIME-MD. The GAD-7 scores 7 common anxiety symptoms. Various versions of the PHQ scales are discussed in the Instruction Manual.

All PHQ, GAD-7 screeners and translations are downloadable from this website and no permission is required to reproduce, translate, display or distribute them. Relevant articles and a bibliography are also freely available.

For further questions please write an e-mail to
questions@phqscreeners.com

PERMISSION TO USE MSPSS

Multidimensional Scale of Perceived Social Support (MSPSS)

Description: A measure of the perceived availability of support.

Format: 12 items assessing 3 sources of support: family, friends, and significant other. Items are rated on a 7-point Likert-scale ranging from 1 (very strongly disagree) to 7 (very strongly agree).

Scoring: The MSPSS can be scored to measure perceived support from family, friends, and a significant other, or global perceived support.

Administration and Burden: Self-administered.

Psychometrics for SCI: Not available;

For non-SCI populations, internal consistencies of the subscales and total scale are excellent (Cronbach's alphas= .85 to .91). In addition, the scales have demonstrated strong test-retest reliability over a 2- to 3-month interval (*r*= .72 to .85). Validity has been established through the negative association of scores on the MSPSS with scores on measures of depression [1].

Languages: English.

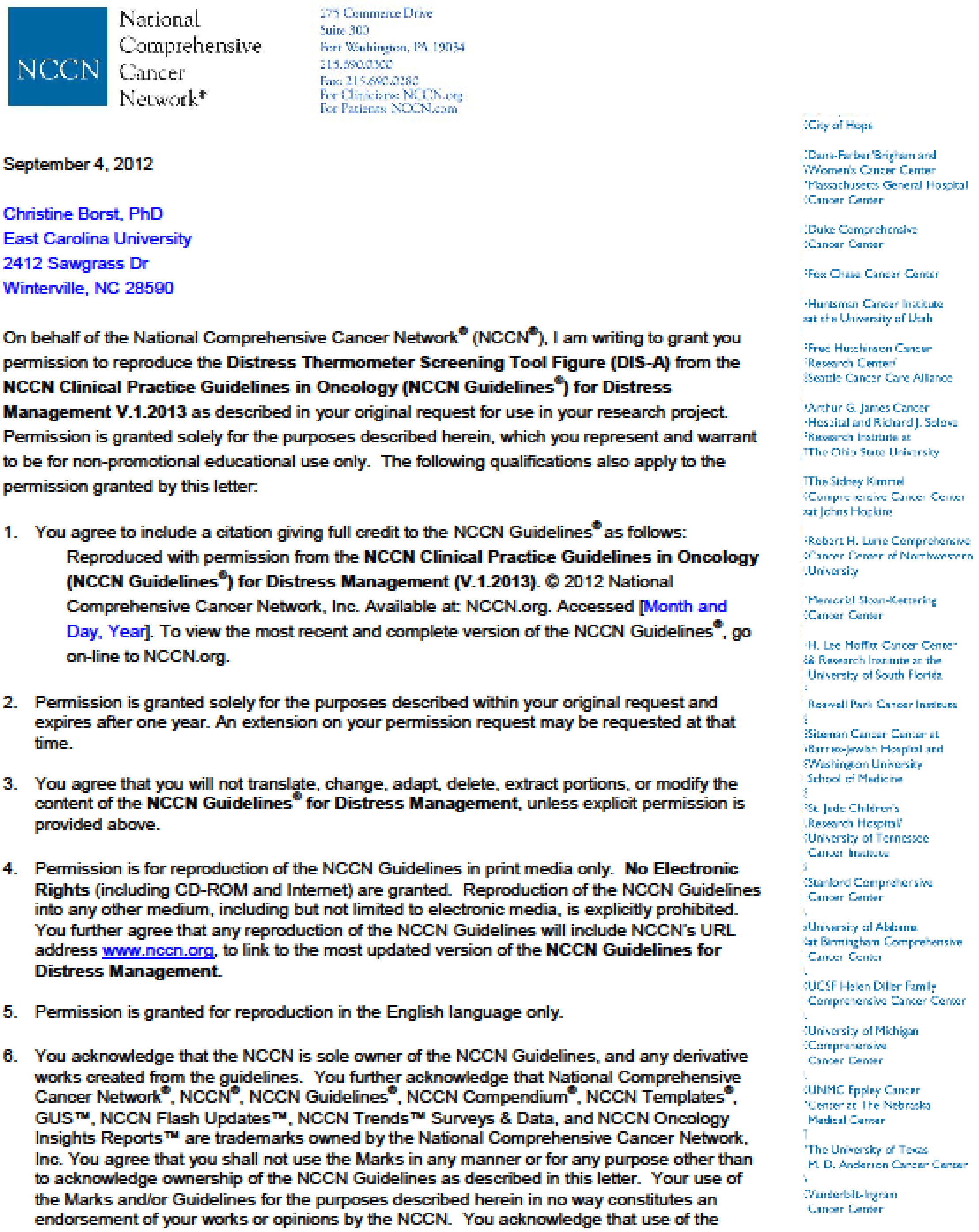
QoL Concept: The questionnaire measures social support, which corresponds to **Boxes C** (achievements) and **E** (subjective evaluations and reactions) of Dijker's Model.

Permissions/Where to Obtain: Public Domain; The MSPSS can be obtained from the IN-CAM Outcomes Database on this page: http://www.outcomesdatabase.org/node/666

References:

1. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional Scale of Perceived Social Support. J Pers Assess. 1988;52:30–41.

PERMISSION TO USE DISTRESS THERMOMETER (AND PROBLEM LIST)



National
Comprehensive
Cancer
Network®

275 Commerce Drive
Suite 300
Fort Washington, PA 19034
215.690.0300
Fax: 215.690.0280
For Clinicians: NCCN.org
For Patients: NCCN.com

September 4, 2012

Christine Borst, PhD
East Carolina University
2412 Sawgrass Dr
Winterville, NC 28590

On behalf of the National Comprehensive Cancer Network® (NCCN®), I am writing to grant you permission to reproduce the **Distress Thermometer Screening Tool Figure (DIS-A)** from the **NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Distress Management V.1.2013** as described in your original request for use in your research project. Permission is granted solely for the purposes described herein, which you represent and warrant to be for non-promotional educational use only. The following qualifications also apply to the permission granted by this letter:

1. You agree to include a citation giving full credit to the NCCN Guidelines® as follows:
   Reproduced with permission from the **NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Distress Management (V.1.2013).** © 2012 National Comprehensive Cancer Network, Inc. Available at: NCCN.org. Accessed [Month and Day, Year]. To view the most recent and complete version of the NCCN Guidelines®, go on-line to NCCN.org.

2. Permission is granted solely for the purposes described within your original request and expires after one year. An extension on your permission request may be requested at that time.

3. You agree that you will not translate, change, adapt, delete, extract portions, or modify the content of the **NCCN Guidelines® for Distress Management**, unless explicit permission is provided above.

4. Permission is for reproduction of the NCCN Guidelines in print media only. **No Electronic Rights** (including CD-ROM and Internet) are granted. Reproduction of the NCCN Guidelines into any other medium, including but not limited to electronic media, is explicitly prohibited. You further agree that any reproduction of the NCCN Guidelines will include NCCN's URL address www.nccn.org, to link to the most updated version of the **NCCN Guidelines for Distress Management.**

5. Permission is granted for reproduction in the English language only.

6. You acknowledge that the NCCN is sole owner of the NCCN Guidelines, and any derivative works created from the guidelines. You further acknowledge that National Comprehensive Cancer Network®, NCCN®, NCCN Guidelines®, NCCN Compendium®, NCCN Templates®, GUS™, NCCN Flash Updates™, NCCN Trends™ Surveys & Data, and NCCN Oncology Insights Reports™ are trademarks owned by the National Comprehensive Cancer Network, Inc. You agree that you shall not use the Marks in any manner or for any purpose other than to acknowledge ownership of the NCCN Guidelines as described in this letter. Your use of the Marks and/or Guidelines for the purposes described herein in no way constitutes an endorsement of your works or opinions by the NCCN. You acknowledge that use of the

PERMISSION TO USE SF12V2 MCS AND PCS SUBSCALES

Your QualityMetric - order details & license agreement - CT144566/OP022554

Pam Bartley [pbartley@qualitymetric.com]

Actions

To:

Borst, Christine Elizabeth Walsh

Attachments:

East Carolina University -~1.pdf (106 KB)[Open in Browser]

Dissertation

Monday, June 18, 2012 9:10 AM

You replied on 6/18/2012 11:16 AM.

Dear Christine:

I want to thank you for complying with all of my requests for documentation and information. The reason the qualification process for our OGSR Unfunded Student Program is so rigid is because our program is designed to help students working on their thesis or dissertation projects. We know that our academic colleagues usually do not have outside funding resources and often are working with very stringent budgetary confinement.

You will be happy to hear that your study has been qualified to our program. This means that you are being offered licensure, copies of the most updated version of our survey form (in both .pdf and MSWord formats), scoring software with scoring credits, MSE (Missing Score Estimator) scoring add-on feature, and an electronic version of the survey appropriate Quick Start Guide. These items usually cost hundreds or even thousands of dollars. It is important to us that you are able to fit our survey form into your study. Every publication, every study that utilizes our survey lends credence to the fact that our survey forms are widely used and “world standard”. For this reason, you will be receiving a license package which includes all of the above mentioned materials and licensure for FREE.

I will need for you to review, sign and return all pages of the attached document via scan/email or direct fax to: 401-642-9341. Once returned, I will be able to release the order to your email and will send you a countersigned copy of the Agreement for your records.

I hope that this is good news to you and your study. Please let me know if I can assist in any way…

-Pam Bartley