BARRIERS TO SCREENING, DIAGNOSIS, AND TREATMENT OF TYPE 2 DIABETES IN THE PEDIATRIC POPULATION WITHIN A MILITARY TREATMENT FACILITY

by

Elizabeth April Gminski

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As members of the DNP Project Committee, we certify that we have read the DNP Project prepared by Elizabeth April Gminski entitled “Barriers to Screening, Diagnosis, and Treatment of Type 2 Diabetes in the Pediatric Population Within a Military Treatment Facility” and recommend that it be accepted as fulfilling the DNP Project requirement for the Degree of Doctor of Nursing Practice.

_________________________________________ Date: April 12, 2016
Janet DuBois, DNP, ARNP, FNP-BC, FAANP

_________________________________________ Date: April 12, 2016
Donna McArthur, PhD, FNP-BC, FAANP, FNAP

_________________________________________ Date: April 12, 2016
Karen M. O’Connell, Lt. Col., USAF, NC, PhD, RN, CEN, NEA-BC
Director, Clinical Investigation Cell, Wright-Patterson Medical Center

Final approval and acceptance of this DNP Project is contingent upon the candidate’s submission of the final copies of the DNP Project to the Graduate College.

I hereby certify that I have read this DNP Project prepared under my direction and recommend that it be accepted as fulfilling the DNP Project requirement.

_________________________________________ Date: April 12, 2016
DNP Project Director: Janet DuBois, DNP, ARNP, FNP-BC, FAANP
STATEMENT BY AUTHOR

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SIGNED: Elizabeth April Gminski

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ABSTRACT

Type 2 Diabetes Mellitus (T2DM) was once a disease process found only in the adult population. However, incidence rates of T2DM in children and adolescents are increasing at alarming rates and becoming a grave public health concern. As many as 5,089 individuals under the age of 20 are newly diagnosed with T2DM each year. The military community is not immune to these national trends and T2DM among military dependents is growing at similar rates to that of the civilian population.

The primary aim of this DNP project was to investigate if barriers exist with regard to pediatric military dependents, ages 10-17 years, receiving appropriate diagnosis, and treatment of T2DM. Previously published literature has identified health disparities exist within the Military Health System (MHS), despite beneficiaries having equal access to care. This project also sought to assess providers’ use of Evidence Based Practice (EBP) and Clinical Practice Guidelines (CPGs) in the treatment of pediatric patients’ ages 10-17 with T2DM, as it has been indicated that use of evidence based guidelines for management of T2DM vary among military treatment facilities.

Results of the DNP Project reflected information found in previous evidence based literature. Fifty percent of providers felt there is “probably” a health disparity among Type 2 Diabetic youth who seek care at a Military Treatment Facility (MTF). Diverse responses were received regarding applicable health disparity indicators among MHS beneficiaries, indicating these disparities may be multifactorial. Routine incorporation of EBP and CPGs into clinical practice also appeared to vary among participants. It is evident that further research may positively contribute to current understanding of health disparities among MHS beneficiaries.
INTRODUCTION

Background Knowledge

Diabetes prevalence within the military population enrolled in the Military Health System (MHS) is largely understudied (Chao, 2013). Despite popular assumptions related to necessary physical fitness standards of military members, the military community remains at high risk for developing T2DM (Lott, 2009; True et al., 2013). Lott (2009) asserts that incidence rates of T2DM among the MHS beneficiaries are reaching similar rates to that of civilian populations with 1.6 cases versus 1.9 cases per 1,000 individuals a year, respectively.

The United States Air Force Clinical Information Branch reports an overall incidence of 38,000 MHS beneficiaries with T2DM of which 18,192 of these are military dependents (dependent is defined as the spouse or children of the military member) (Lott, 2009). Approximately 60% of the MHS’ beneficiaries are composed of military dependents (Brown, Kurlantzick, McCall, Williams, Gantt, & Granger, 2009). Also, from 2006 to 2010, the MHS insured population grew from 3.4 million to 3.7 million (Chao, 2013).

Dabelea and colleagues (2014) cite there was a prevalence of 0.34 per 1,000 youth with a diagnosis of T2DM in the United States, or 588 individuals out of 1.7 million in 2001. By the year 2009 the prevalence increased to 0.46 per 1000 individuals (Dabelea et al., 2014). Therefore, over an eight year time frame there was an overall increase of 30.5% of T2DM in youth ages 0-19 years (Dabelea et al., 2014). Results from the ongoing, multi-state SEARCH for Diabetes in Youth study indicate that 5,089 individuals under the age of 20 are newly diagnosed with T2DM each year (Centers for Disease Control and Prevention [CDC], 2014). Study results also reveal that new diagnoses of T2DM are greatest among youth ages 10-19
years of age when compared with younger children and have greater incidence rates among minority populations than non-Hispanic whites (CDC, 2014). These data represent a grave, national public health concern for the pediatric population.

Baum and colleagues (2009) assert that the United States has long subscribed to the Western biomedical focus on individual health. However, in doing so we may be inviting health inequalities (Baum, Schone, Higgins, Granger, Casscells, & Croghan, 2009). Health inequality, defined as a difference that is unjust and avoidable, is a compilation of structural, social, economic and political inequalities within a greater system and may exist even in countries of great economic wealth (Baum et al., 2009, p. 1967).

Health inequalities may be further confounded by fragmentation within our health care system (Enthoven, 2009; Stange, 2009). Fragmentation may be described as an unbalance or brokenness related to focusing solely on individual pieces without evaluating their connection to the whole (Stange, 2009). Enthoven (2009) relates the concept of fragmentation to health care stating it is a systemic misalignment that negatively affects quality, cost and ultimately patient outcomes. According to Fineberg (2012), a successful health care system entails the three attributes of healthy people, superior care and fairness. The evaluation of social determinants of health, particularly the role health insurance plays in individuals’ health status is gaining increasing awareness (Baum et al., 2009).

**Significance to Health Care and Advanced Practice Nursing**

The issue of T2DM in pediatric populations has significant implications for the current and future state of healthcare as well as for advanced practice nursing. Due to a frequent insidious disease onset, 10-17 year olds are often initially misdiagnosed (Tieh & Dreimane,
As T2DM was once considered only a condition found in adults, many pediatric clinicians often feel ill equipped in disease diagnosis, and treatment (Copeland, 2013; Tieh & Dreimane, 2013). A frequent concern identified by providers is the limited Food and Drug Administration (FDA) approved pharmacological interventions for this age group (Tieh & Dreimane, 2013). As there is currently a lack of evidence based literature directly pertaining to T2DM in the pediatric population, there is a subsequent deficit in long-term outcome data for this population which could make complicated disease management problematic in the future (Tieh & Dreimane, 2013). This has significant future implications, as pediatric patients with T2DM are significantly more likely to experience higher and earlier incidence of co-morbidities and disease complications (Tieh & Dreimane, 2013).

Richardson and colleagues (2014) found that primary care nurse practitioners improved outcomes of glycemic control and increased quality of care in patients with T2DM. Nurse practitioners provide a unique asset to the healthcare community as they have the ability to manage complex medication regimens without physician authorization (Richardson, Derouin, Vorderstrasse, Hipkens, & Thompson, 2014). Study findings support improved self-efficacy in patients through innovative methods of communication and treatment by nurse practitioners (Richardson et al., 2014).

As modes of communication continue to expand, nurse practitioners are in a unique position to offer evidence-based patient and family teaching that is individualized to patients and their life circumstances (Richardson et al., 2014). Not only is patient and family education important but continuing education for the clinician must also be considered. Awareness and knowledge of clinical practice guidelines (CPGs) and other up to date evidence based
literature is also of great importance for the nurse practitioner. As the topic of pediatric T2DM remains a relatively recent development, nurse practitioners have the opportunity to apply EBP and incorporate CPGs into clinical practice

**Local Problem**

The MHS is managed by the Department of Defense (DoD) and represents one the United States’ largest healthcare systems (Brown et al., 2009). Infrastructure within MHS is similar to a health maintenance organization (HMO) style of health insurance provider and subsequently, the referral process is often quite complicated (Brown et al., 2009). According to Keesler Air Force Base’s instructional outline for MHS beneficiaries, the proper process entails ten various steps before acquiring a referral appointment with a specialist outside of the beneficiary’s Primary Care Provider (PCP) (Keesler Air Force Base Referral Management Center, n.d.).

At the local level, the state of Ohio is home to Wright Patterson Air Force Base, which contains the designated lead medical treatment facility for the Northern region of the country. Wright Patterson Medical Center has Joint Commission Accreditation and is a multispecialty facility (Wright Patterson Air Force Base, n.d.). Though they have a variety of specialties represented, many MHS beneficiary dependents are referred to in-network civilian specialty providers within the local area (Wright Patterson Air Force Base, n.d.).

Statistics provided by Ohio’s Department of Health on the incidence of T2DM in children and adolescents indicate that in the year 2001 the prevalence of T2DM in children ages 0-19 years was 0.22 per 1,000 youth (Ohio Department of Health, 2009). Statistics from this time period revealed that there was a higher incidence of T2DM in African American
children ages 10-19 years when compared to their white non-Hispanic peers. Yet American Indian youth ages 15-19 years had the highest rate of incidence of T2DM in comparison to all of the represented ethnicities in the state of Ohio (Ohio Department of Health, 2009).

The state of Ohio is one of the five states currently participating in the SEARCH for Diabetes in Youth study (Wake Forest Baptist Medical Center, 2015). This is a national multi-center study to determine the extent of T2DM in various communities and the impact on different pediatric and young adult populations within the United States (Wake Forest Baptist Medical Center, 2015). Beginning in 2000 and projected to extend through the year 2015, the study contains more than 20,000 participants who represent all varieties of racial and ethnic backgrounds (Wake Forest Baptist Medical Center, 2015). The SEARCH for Diabetes in Youth study is funded by the Centers for Disease Control and Prevention (CDC) and the National Institute of Health (NIH) and its fundamental purpose is to investigate the prevalence, diagnosis, treatment and outcomes for both Type 1 Diabetes and T2DM in children and adolescents (CDC, 2014).

On a national level, between the years of 2008 and 2009, the annual incidence of children and adolescents diagnosed with T2DM was estimated to be 5,089 (American Diabetes Association, 2015). National percentages of diabetes mellitus (DM) prevalence in ethnic minorities when compared to their white counterparts also reflects the state of Ohio’s trends (American Diabetes Association, 2015). Per the American Diabetes Association (2015), the estimated rates of DM according to racial groups are as follows: Non-Hispanic whites comprise 7.6%, Asian Americans represent 9.0%, Hispanics include 12.8%, non-
Hispanic African American comprise 13.2% and American Indians/Alaskan Natives bear the largest percentage at 15.9%.

Military dependents include a significant percentage of those diagnosed with T2DM within the military population (Lott, 2009). The number of MHS beneficiaries also continues to increase (Brown et al., 2009). Despite growing amounts of data related to the local and national incidence of T2DM in the pediatric population and potential health disparities, there is a lack of literature pertaining to these issues in the pediatric military dependent population.

**Purpose and Aims**

The project’s overall purpose was to identify if barriers exist in the diagnosis and treatment of T2DM among pediatric military dependents ages 10-17. One of the projects aims included deciphering if potential barriers result in health disparities. Areas of interest included the concept of fragmentation and if social determinants of health, including, age, gender, race or ethnicity, socioeconomic status, or personal value placed on health care, and the choice to access care impact the health status of pediatric military dependents with T2DM (Baum et al., 2009; Enthoven, 2009; Stange, 2009). Another project aim was assessing providers’ use of EBP and CPGs related to T2DM within clinical practice. As evidenced by research conducted by McCraw and colleagues (2010) there is variation in adherence to diabetes treatment guidelines, even among military medical facilities located within the same state.

Several stakeholders must be considered in relation to the project. On a weekly basis, the MHS provides healthcare related services to 9.6 million MHS beneficiaries, which include 23,300 inpatient admissions, 1.8 million outpatient visits, 2.6 million prescription fills and the processing of 3.5 million claims (MHS Stakeholder’s Report, 2010). When considering the
volume of services provided at minimal to no out-of-pocket expense to the beneficiaries and economic constraints, the DoD will be interested in economic considerations and efficient use of resources. Other key stakeholders included primary care providers as well as pediatric and adolescent health specialists as their perceptions on barriers to care were valuable for this project.

**Study Questions**

The project sought to answer the following questions:

1. Are there barriers to diagnosis of T2DM in military dependents ages 10-17 years old?
2. Do military dependents ages 10-17 years obtain appropriate screening, treatment, and referral for T2DM?
3. In military dependents ages 10-17 years with T2DM, what are the barriers to accessing medical care?

**SYNTHESIS OF EVIDENCE AND THEORETICAL FRAMEWORK**

**Appraisal of Literature**

A literature search was conducted using search terms that included military healthcare, military medicine, TriCare, Type 2 Diabetes, youth, dependents, disparities, and military practice guidelines. The following three databases were used: PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Embase.

Thousands of literature results were retrieved related to these specific search terms. Subsequently, exclusion criteria were utilized. Literature not published within the United States, not written in the English language and published before the year 2009 was excluded. Twenty-five articles met the inclusion criteria and were appraised.
The national Healthy People 2020 program defines health disparity as a specific difference in health status that is closely tied to social, economic, and/or environmental disadvantages (Office of Disease Prevention and Health Promotion, 2015). Maintaining health insurance has been indicated as the most significant determinant in an individual’s quality of care and overall health status (National Healthcare Quality Report [NHQR], 2015). In addition, individuals with a diagnosis of T2DM who are of lower socioeconomic status, lack insurance and may be of an ethnic minority, receive less recommended diabetic care measures when compared to their white counterparts, especially those that carry healthcare insurance and are of higher socioeconomic status (NHQR, 2015).

Eligibility for MHS benefits is unique in that qualifying criteria are solely based on current or prior military service as a sponsor or a dependent (sponsor defined as military service member and dependent defined as a spouse or child of service member), and coverage is provided regardless of past medical history and current health conditions (Bagchi et al., 2009; Brown et al., 2009). Indeed, the MHS strives to provide equal access to care and treatment to its beneficiaries (McCraw et al., 2010).

In contrast to the described MHS benefits, studies have emerged that identify disparities within the MHS. Hatzfeld, LaVeist and Gaston-Johansson (2012) hypothesized in their secondary analysis that there would be no clinically significant disparities among MHS beneficiaries. However, study findings revealed there was indeed a disparity when evaluating prevalence and outcomes of hypertension, dyslipidemia, diabetes, and asthma in active-duty Air Force service members (Hatzfeld, LaVeist, & Gaston-Johansson, 2012). Non-Hispanic black individuals were more consistently diagnosed with the above health conditions than
their non-Hispanic white counterparts (Hatzfeld et al., 2012). Interestingly, this study also indicated that despite higher disease prevalence, military members of an ethnic minority had a higher likelihood of participating in preventative health measures than white service members (Hatzfeld et al., 2012). As military members appear to have equitable access to health care and living conditions, there is a complex matrix of possible attributable factors involved in these health disparities (Hatzfeld et al., 2012).

In their exploratory analysis, Bagchi and colleagues (2009) support that beneficiaries of ethnic minorities receive more health care services than their white counterparts. However, despite increased use of services, Bagchi and colleagues (2009) concede racial and ethnic disparities within the MHS do exist, though they may be less readily apparent than in the United States’ health care system as a whole.

Health disparities appear to translate to youth dependents of military members as well. Stewart and colleagues (2010) conducted a retrospective cohort analysis and found that racial and ethnic disparities exist in asthma prevalence, treatment and outcomes among children of service members, despite their equal access to universal and comprehensive health insurance coverage. Non-Hispanic black and Hispanic children were less likely than their white counterparts to be treated by a specialist (Stewart, Higgins, McLaughlin, Williams, Granger & Croghan, 2010). However, black children filled more prescriptions for asthma medications than white beneficiaries (Stewart et al., 2010). Also, children of ethnic minorities were more likely to seek urgent care in the Emergency Department (ED) related to asthma exacerbations than white youth (Stewart et al., 2010). Stewart and colleagues (2010) therefore assert that
disparities within health care are complex, multifaceted and extend beyond simply equal access to care.

The incorporation of evidence-based practice (EBP) in the form of clinical practice guidelines (CPGs) provides clinicians with a solid knowledge base on the most recent available literature. Unfortunately, there appears to be a general variation in use of CPGs among military providers and a definitive lack of a specific CPG related to pediatric T2DM within the MHS (McCraw et al., 2010). In their retrospective chart review, McCraw et al. (2010) found inconsistency in the use and compliance with CPGs in treatment of adults with T2DM within two military treatment facilities located in the same state. Likewise, these researchers also found significant differences in staff care delivery as well as wide variation in provider documentation (McCraw et al., 2010).

Indeed, Bridges (2010) asserts there is difficulty in translating research into practice, particularly within the MHS. This author identifies one of the challenges in implementing EBP as the lack of relevant studies being systematically complied, synthesized and being easily accessible to MHS providers (Bridges, 2010). In addition, utilization of EBP is highly dependent on organizational structures, the EBP users and the specific innovation (Bridges, 2010).

Such challenges exist within the MHS. Copeland and colleagues (2013) developed a CPG entitled, Management of Newly Diagnosed Type 2 Diabetes Mellitus (T2DM) in Children and Adolescents, in collaboration with the American Academy of Pediatrics, the American Diabetes Association, the Pediatric Endocrine Society, the American Academy of Family Physicians and the Academy of Nutrition and Dietetics. This CPG provides support
for the evidence based diagnosis and treatment of the Type 2 Diabetic pediatric population. Although the Veterans Health Administration (VHA) and DoD have developed a CPG related to adults with T2DM, the only mention of youth diagnosed with this disease is related to the necessity of referral to a pediatric specialist for those 17 years of age and younger (The Office of Quality and Performance, VA & Quality Management Division, United States Army, 2010). However, despite these challenges specific to the MHS, the Diabetes and Obesity Research Working Group (DORWG) was created in 2010 for the purpose of directing and conducting research that is related to obesity and diabetes (True et al., 2013). This research group consists of subject matter experts within the Air Force research leadership and as of 2013, over 30 new research projects pertaining to obesity and diabetes have been initiated by the DORWG (2013).

Per the Air Force Instruction (AFI) 36-2110, active duty military members are subject to a regular “permanent change of station” (PCS) tempo that defines a minimum and maximum amount of time they may reside at one assignment (Department of the Air Force, 2015). Waivers exist for special circumstances, but in general, an enlisted Airman must remain at a duty station for a minimum of 48 months but no more than 60 months (Department of the Air Force, 2015). Conversely, an officer must remain at a duty station for a minimum of 24 months and maximum of 48 months (Department of the Air Force, 2015).

By virtue of frequently interrupted provider-patient relationships due to recurrent PCS cycles, consistency in patient and family education may be disrupted. The DEBATE Trial, a multi-centered cluster-randomized control trial (RCT) hypothesizes that there is a positive correlation between the patient and provider relationship in successful disease treatment
(Drewelow et al., 2012). This currently ongoing study identifies that a decrease in a patient’s HbA1c of 0.5 or greater within a specified time frame may indicate a strong patient-provider relationship in which shared decision-making is promoted and lasting patient empowerment is fostered (Drewelow et al., 2012).

Haas and colleagues (2012) also assert that within diabetes self-management education (DSME) provided to patients by clinicians, it is critical to understand the patient and family’s unique ethnic and cultural background, and level of health literacy. It is also crucial for the provider to consider barriers that pediatric patients with T2DM may face throughout their care, which may ultimately lead to health disparities (Haas et al., 2012). In effort to promote successful treatment and reduce disparities, providers need to focus on culturally relevant and literacy appropriate evidence-based education (Haas et al., 2012).

Another potential underlying issue related to health disparities may be attributed to individual patient and family values, views and beliefs regarding healthcare, the diabetes disease process and the necessary life-style modifications involved in chronic disease management. Salamon and colleagues (2012) explored themes related to youth’s concept of illness, adjustment to the diagnosis of T2DM and motivation regarding performing self-care behaviors. Providers may contribute to successful treatment and subsequently work towards minimizing disparities by first providing emotional support to patients and families as they psychologically adjust to the youth having a chronic disease (Salamon et al., 2012). The clinician may also promote self-management skills by emphasizing problem solving skills and breaking down self-care behaviors into manageable tasks (Salamon et al., 2012).
As evidenced by the research conducted by Bagchi et al. (2009), Hatzfeld et al. (2012), and Stewart et al. (2010), health disparities occur among MHS beneficiaries. However, the exact attributable cause of these inequalities remains unclear but is likely multifactorial (Stewart et al., 2010). It is evident that there is a need for continued research on the topic of barriers facing pediatric patients when accessing care within the MHS.

**Strengths and Weaknesses of Literature Findings**

Though perhaps largely unconsidered given the universal and comprehensive coverage, the MHS does mirror some of the United States’ healthcare system’s trends with regard to disparities in health status among its beneficiaries. Strengths of the current literature include problem identification and assertions made in support of existing health disparities are well founded in evidence. Findings related to racial and ethnic disparities within the MHS are consistent across the current available literature and correlate with national and local trends in health disparities. An inherent weakness of the current literature includes minimal research relating directly to dependents of military members, ages 10-17, with the diagnosis of T2DM. Throughout the literature review process, studies that address barriers pediatric patients with T2DM face when accessing care through the MHS were not found.

**Gaps in Knowledge**

Evidence supports a health disparity exists within the MHS (Bagchi et al., 2009; Hatzfeld et al., 2012; Stewart et al., 2010). However, it is unknown if health disparities exist related to the concept of fragmentation, social determinants of health or other unconsidered factors (Baum et al., 2009; Enthoven, 2009; Stange, 2009). Therefore, advanced practice nurses have the unique opportunity to close this gap in knowledge and develop new research
on this relatively unexplored topic of possible health disparities among pediatric military dependents with T2DM.

**Theoretical Framework**

Assessing barriers to access to care and health disparities may be challenging. However, healthcare professionals caring for the Type 2 Diabetic pediatric population within a military treatment facility (MTF) may have a plethora of insights into these issues. Clinicians’ perspectives, expertise and knowledge regarding EBP substantially contributed to the success of this project and assisted in identifying potential barriers and subsequent health disparities among this population.

The Iowa Model of Evidence Based Practice was an appropriate supporting theoretical framework for this project as it serves as a guide in assessing the knowledge, skills and attitudes of providers regarding EBP, which is a key component of this research project (Titler, 2012). Another primary function of the Iowa Model is to provide guidance to healthcare providers as they seek to implement EBP to improve healthcare outcomes (Tilter, 2012). There are several foundational assumptions within the model, which include: 1) teamwork is important when incorporating evidence into practice; 2) evaluation is a critical step in the EBP process; 3) EBP is a dynamic process, not simply a single event; and, 4) the model is applicable to the entire interdisciplinary healthcare team (Titler, 2012).

The interdisciplinary team of providers remain on the front lines of decision making with regard to the screening, diagnosis, treatment and the referral process of these military dependents ages 10-17 with a diagnosis of T2DM. Therefore, it was crucial to not only assess clinicians’ perspectives on barriers that this population may face in effort to identify potential
health disparities, but also their knowledge regarding EBP and its application to decision-making processes. Bridges (2010) concedes that translating research to clinical practice and decision-making processes is difficult, particularly within military healthcare institutions. This author cites a primary barrier to the incorporation of EBP into practice, is the lack of organized and complete bodies of literature that are population specific (Bridges, 2010).

METHODS

Ethical Issues

Due to a history of questionable biomedical research conducted with U.S. service members in years past that included experiments with mustard gas, radiation, biological warfare, and psychotropic drugs, military personnel are now considered a protected population (O’Connell, 2015; Parasidis, 2012). Military hierarchy with a structured rank system may also significantly influence service members to undergo experimental interventions within a research study, when in different circumstances they may not consent to do so (Parasidis, 2012). Lower-ranking service members may feel pressured to participate as they may interpret refusing “treatment” as disobeying an official order (Parasidis, 2012). Within the military culture, consequences of disobeying an official order may result in a court-martial and subsequent dishonorable discharge from military service (Parasidis, 2012). Therefore, military members may feel coerced to participate in research studies as they may equate refusal with detrimental career consequences (Parasidis, 2012).

Subsequently, there are stringent regulations and guidelines on what types of research may be conducted on a military institution as well as selection of study participants. In an effort to promote respect for persons, there was a detailed introduction and disclosure
statement prior to the actual survey outlining goals of the research, explanation of the research method, as well as explicit statements regarding confidentiality being maintained and answers to survey questions being de-identified. Also, to reduce likelihood of perceived bias, civilian providers who care for pediatric patients ages 10-17 were also invited to participate in the survey.

Through careful scrutinizing by the Air Force Survey Office, the Wright Patterson Medical Center (WPMC) Institutional Review Board (IRB) as well as the evaluation per the University of Arizona’s Research Department, beneficence was promoted and risk was minimized. Justice was promoted by this project through incorporation of interdisciplinary civilian and military healthcare professionals that care for military dependents ages 10-17 with T2DM in the survey. Inclusion criteria for participants was broad and attempted to be non-discriminatory. A variety of roles were invited to participate, including pediatricians, family practice physicians, adolescent health specialists, nurse practitioners, physician’s assistants and medical residents. Research results were intended to benefit the target population, to also support the principle of justice. Key stakeholders within Wright Patterson’s medical research department as well as the pediatric unit were identified and buy-in was achieved.

**Setting**

The project setting was at the Wright Patterson Air Force Base Medical Center, located in Dayton, Ohio. Wright Patterson’s Medical Center (WPMC) is accredited by the Joint Commission and is a 57-bed, multispecialty facility serving the military population and their dependents (Wright Patterson Air Force Base, n.d.)
Study Participants

Interdisciplinary health care professionals at WPMC that are involved in the care of youth with T2DM were invited to participate in the survey. As the military population has been deemed a protected population, both civilian and military healthcare professionals were invited to participate (O’Connell, 2015). On a daily basis, WPMC has 10-14 staff providers working within the pediatric department, including two nurse practitioners. Medical residents also frequently perform rotations at WPMC, though the number of residents fluctuates routinely. The week the survey was distributed, thirteen residents and one chief resident were present within the department.

Data Collection

The survey explored providers’ opinions and attitudes regarding any potential barriers pediatric patients ages 10-17 with T2DM who utilize a Military Treatment Facility (MTF) may face when accessing care. To promote increased survey participation, surveys were printed and personally distributed per Captain Kristen Albert, MSN, RN-BC, Nurse Manager of the Pediatric Department.

Recruitment of participants occurred in collaboration with WPMC staff members, including Lieutenant Colonel Karen O’Connell, PhD, RN, CEN, NEA-BC, Nurse Scientist and Director of WPMC Clinical Investigation Cell as well as Captain Kathrine Griffiths, MS, PCNS-BC, RN-BC, Pediatric Clinical Nurse Specialist at WPMC and Captain Kristen Albert, MSN, RN-BC, Nurse Manager of the Pediatric Department.

An introduction and disclosure statement was included prior to the beginning of the survey to enhance reliability, ensure confidentiality of participants as well as describe
respondents’ expectations for the survey (Appendix A) (University of Wisconsin, 2010).

Consent for participation was explained in the introduction and disclosure form. By beginning and completing the survey, the providers thereby acknowledged that they had read the information and disclosure form and consented to participation.

Demographic questions related to the provider’s role, length of time in practice, level of education, affiliation (civilian provider or military provider) with WPMC as well as rank and branch of service, if applicable, were included (Appendix B) (O’Connell, 2015). The survey included 12 questions as it is crucial to bear in mind the issue of subject burden and survey questions must consider the perspective of the respondents while maintaining focus on the overall goal of the project (O’Connell, 2015; University of Wisconsin, 2010).

Questions within the survey consisted of multiple choice, select all that apply, and Likert scale responses (Appendix C). Using this varied survey format, providers were asked questions pertaining to their opinions regarding if barriers exist for pediatric patients ages 10-17 with T2DM who seek care at a military medical treatment facility as well as their opinions on possible health disparities occurring among this same population. Survey questions also pertained to the screening methods and diagnostic criteria providers utilize within their personal practice. Incorporation of EBP and routine use of CPGs were also assessed. Finally, providers were asked their perception on the biggest obstacle they face when attempting to provide high quality care to the pediatric patients with T2DM. Three independent expert survey reviewers to enhance the credibility and quality of survey questions assessed content validity. These individuals demonstrated expertise in the areas of pediatric T2DM, conducting research within MTFs and the proper technique of formulating surveys to optimize study data.
Methods of Evaluation

Data was obtained through the providers’ responses to survey questions. Descriptive statistical methods were utilized to analyze data as nominal and ordinal data were obtained through the survey. Via the five demographic questions prior to the actual survey, nominal data was gathered. As the 12 survey questions are a varied format and include the use of Likert scales, ordinal data along with nominal data was obtained for evaluation. Data analysis was conducted utilizing functions within version 2016 of Microsoft Excel.

RESULTS

A total of 16 health care providers consented and participated in the survey, resulting in a high participation rate of 57%. In response to the demographic questions, ten participants described their role at Wright Patterson Medical Facility as being a “Pediatrician.” Four participants specified they were “Pediatric Residents,” while two identified themselves as “Residents.” All of the providers responded that they had been in practice less than five years. Fifteen out of 16 responded they had attained a doctorate level education and one participant did not specify level of education. Of the participants, 15 out of 16 identified themselves as being active duty military service members and one responded as being a civilian. All of the providers self-identified as being active duty military, specified they were members of the Air Force. Every provider identifying as active duty Air Force service member also specified their rank being as being a Captain.
TABLE 1. Demographic Characteristics of Providers

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Responses from Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role at Wright Patterson Medical Facility</td>
<td>10 Pediatricians</td>
</tr>
<tr>
<td></td>
<td>4 Pediatric Residents</td>
</tr>
<tr>
<td></td>
<td>2 Residents</td>
</tr>
<tr>
<td>Years in practice</td>
<td>16 reported less than 5 years</td>
</tr>
<tr>
<td>Highest level of education attained</td>
<td>15 reported a Doctorate degree, 1 no response</td>
</tr>
<tr>
<td>Affiliation with Wright Patterson Air Force Base</td>
<td>15 reported Active Duty, 1 reported Civilian</td>
</tr>
<tr>
<td>Rank (if applicable)</td>
<td>15 reported Captain</td>
</tr>
<tr>
<td>Branch of service (if applicable)</td>
<td>15 reported Air Force service members</td>
</tr>
</tbody>
</table>

Responses from participants regarding their preferred screening modalities to evaluate pediatric patients, ages 10-17 for T2DM, were diverse (Figure 2). Fifteen out of 16 participants (94%) stated they utilized growth charts, including the child’s BMI, as a primary method of evaluation. Most of the providers (94%) also responded that they consider the patient’s personal history of hypertension, dyslipidemia, peripheral neuropathy or polycystic ovary disease, when making the diagnosis. The majority of providers (88%) also took into consideration a family history of diabetes. Half of providers responded they also consider the child’s race and ethnicity as it relates to disease risk. Six out of 16 providers stated they also screen for T2DM utilizing patient food and activity journals. Only five out of 16 providers asserted they take into account maternal history of T2DM or gestational diabetes as well as the patient’s personal history of preterm birth, low birth weight or a birth weight greater than nine pounds, respectively.
Mixed answers were also received in response to the diagnostic criteria providers utilize to diagnose pediatric patients, 10-17 years, with T2DM. The highest level of provider responses (88%) identified that they utilize a plasma glucose level of equal or greater than 200mg/dl to confirm a diagnosis. Just over half of participants (56%) identified that they make a diagnosis of T2DM according to an HbgA1c of above 6%. Seven out of 16 providers specified they would make a diagnosis in a child who displays symptoms of polyuria, polydipsia or unexplained weight loss. A quarter of participants responded that they would also utilize obesity defined as a BMI greater or equal to the 95th percentile for age and gender, as diagnostic criteria.

When asked the likelihood of placing a referral for pediatric patients ages 10-17, with either suspected or confirmed T2DM, ten out of 16 providers (63%) responded “probably
yes.” A quarter of participants responded “definitely yes.” One provider responded “probably not” and one participant did not select and answer to this survey question.

Survey questions related to patient health care access also yielded an array of results. Providers were asked to select barriers they felt military dependents ages 10-17 may face when accessing care through a MTF. The greatest number of participants (69%) viewed families frequently PCSing to new locations as a barrier. Half of providers felt appointment times that were convenient for the youth’s school schedule were also a barrier to care. Just under half of participants felt that military healthcare providers frequently PCSing to new locations also resulted in a barrier. Six out of 16 respondents also felt that long wait times for medical appointments were a barrier to youth. One quarter of participants felt that beneficiaries’ misunderstanding or lack of knowledge regarding services provided by the MHS also presented a barrier to care.

When providers were asked what they felt the biggest obstacle they face when providing care to pediatric military dependents ages 10-17 was, 14 out of 16 (88%) responded youth’s compliance with lifestyle modifications and medication regimen. Less than half attributed family and caretaker knowledge regarding the disease process and need for lifestyle modifications as being an obstacle. One participant responded that a lack of resources as a provider was an obstacle. Another participant also wrote, “Limited appointment times” as being the one of the biggest obstacles.

Using a Likert scale, providers where asked to identify if they felt there was a health disparity among MHS pediatric beneficiaries, ages 10-17, diagnosed with T2DM. Half of
participants responded, “probably yes.” Seven out of 16 providers selected, “probably not” and one participant wrote “?” next to the question and did not definitively circle a response.

Providers were then asked to identify which health disparity indicators they felt applied to pediatric military dependents, ages 10-17 that obtain care through a MTF (Figure 3). Twelve out of 16 providers (75%) felt that the socioeconomic status of the youth’s family applied to this population. Over half (69%) of providers also felt that the level of education of the sponsor and family applied. A fourth of providers also selected that the race and/or ethnicity of the youth and/or family may be applicable. One provider also wrote, “Lack of continuity of care and complicated sharing of medical records to outside hospitals” as another issue contributing to a health disparity.

**FIGURE 2.** Providers’ Perceptions of Health Disparities.
The remainder of the survey questions addressed clinical practice. Using a Likert scale format, providers were asked if they felt completely comfortable screening, diagnosing, treating and managing pediatric patients, ages 10-17, with T2DM. Nine out of 16 providers (57%) responded, “agree.” Less than half selected “disagree” and only two providers stated, “strongly agree.”

Also using a Likert scale format, providers were asked if Evidence Based Practice is foundational in their practice. Twelve out of 16 providers (75%) responded “agree” while the other 25% selected “strongly agree.” Providers were then asked if Clinical Practice Guidelines were readily available when caring for T2DM youth that receive care through the MTF. Ten out of 16 providers (63%) responded, “agree.” A quarter of providers stated “disagree” and two participants did not definitively select an answer to this question.

The last survey question asked providers what is their “go-to” source of information for the care of youth with T2DM (Figure 4). The majority of providers (88%) selected “Epocrates, Medscape or UpToDate” as being primary resources. Seven out of 16 providers identified Clinical Practice Guidelines as being a primary resource. Less than half identified peer reviewed medical journals as being a favored source of information. One provider also selected “Google search engine” as being a primary resource.
FIGURE 3. Providers’ “Go-To” Sources of Information for the Care of Youth with T2DM
DISCUSSION

Strengths and Weaknesses

Strengths of this DNP Project included diverse responses from participants. Responses pertaining to health disparities among MHS beneficiaries reflected the findings from aforementioned Bagchi et al. (2009), Hatzfeld, LaVeist and Gaston-Johansson (2012), as well as Stewart et al. (2010). The range of responses from providers regarding applicable health disparity indicators among the military population reiterates that a disparity is likely multifactorial. Answers regarding providers’ incorporation of EBP and use of CPGs also appeared to echo findings from McCraw et al. (2010) as responses differed on the availability of CPGs and the degree to which they were applicable. Therefore, several findings throughout this DNP Project demonstrate similarity to previous evidence based literature.

Weaknesses of this DNP Project included an initial low number of possible participants, as well as low participation rate relative to the number of providers and residents present during the time of survey distribution. Providers’ backgrounds did not demonstrate a great deal of diversity, in terms of civilian or military affiliation and rank, if applicable. All participants also responded that they had less than five years of experience in practice. Demographic factors of the providers, particularly time in practice, may have impacted some responses.

Limitations

Limitations to this DNP Project include that results are not generalizable to other MTFs or the general population. Wright Patterson Medical Center is unique as it is the largest MTF in the northern area of the country. The size of the facility allows health care services to
be provided in a designated pediatric department with numerous providers on staff, as well as medical residents performing rotations.

Other limitations also included the DNP student having attempted various methods to increase participation rates, including an online survey, an in-person presentation or a focus group. Despite having IRB approval, from Wright Patterson’s IRB committee determining the DNP Project was non-human subjects’ research, the management team within the pediatric department felt that to respect providers’ privacy and anonymity, it was best if the DNP student worked in collaboration with the Nurse Manager to collect paper surveys. These factors greatly reduced the ability of the DNP student to provide further information to providers regarding the subject of pediatric T2DM, emphasize the value of their thoughts and opinions on the topic and subsequently, attempt to gain further buy-in for the project to enhance participation rates.

**Future Research**

Much remains to be discovered regarding the topic of pediatric T2DM among the military population and the health disparities that appear to occur within the MHS. Recommendations for future research include expanding the survey to other MTFs. Through expanding the survey, further data may be obtained regarding health disparities; especially given smaller MTFs may have fewer resources to offer patients.

Conducting future focus groups or personal interviews with providers at MTFs is also highly recommended. Through a mixed methods or qualitative study, further understanding into how health disparities might occur in a health system that allows equal access to care among beneficiaries might be enhanced, as well as insights on factors contributing to the
disparity. Use EBP and CPGs within a MTF could be further explored in a focus group or interview setting.

The survey could also be modified and expanded to occur in a civilian facility and results could be compared and contrasted to data obtained in a MTF. Therefore, the ability to generalize data to the greater population would be enhanced. Information regarding health disparities among pediatric patients with T2DM could be further explored. Incorporation of EBP and use of CPGs among providers could also be additionally assessed.
APPENDIX A:

INTRODUCTION AND DISCLOSURE STATEMENT
Introduction and Disclosure Statement

Dear Sir or Ma’am,

My name is Elizabeth Gminski and I am a Doctor of Nursing Practice (DNP) student at the University of Arizona. I am in the process of conducting my DNP Project, which is an essential component of completing my doctoral level of education in nursing.

As my husband is an active duty Air Force service member and stationed at Wright Patterson Air Force Base, I have a vested interest in military health. The growing public health concern of Type 2 Diabetes (T2DM) in the pediatric population also is of concern to me as a future family practice nurse practitioner. Evidenced based practice and use of clinical practice guidelines are an integral component of addressing health needs of this unique population. Subsequently, my DNP Project seeks to synthesize these topics by assessing any barriers military youth dependents who have been diagnosed with T2DM may face when accessing care through a Military Treatment Facility (MTF).

As a member of the Wright Patterson Medical Center (WPMC) staff, you are invited to participate in this survey regarding T2DM in youth 10-17 years of age. This survey is being conducted by a University of Arizona DNP student in conjunction with the WPMC pediatric clinic. The DNP Project is attempting to identify any barriers military youth dependents, who have been diagnosed with T2DM, may face when accessing care through a MTF. Your thoughts and opinions are key components of this quality improvement project. The online survey will take you approximately 15 minutes to complete and consists of 17 questions. Please be assured that the information you provide will remain confidential and that your responses will be de-identified. Your responses will solely be used for quality improvement purposes. Your participation is completely voluntary, though your knowledge and expertise on the topic of pediatric patients ages 10-17 years with T2DM is invaluable to this DNP Project. Also, please be aware you will not be compensated for your participation and you may withdraw from the survey at any time.

By beginning and completing the survey (the link is provided below), you hereby acknowledge that you have read this information and agree to participation in this survey, with the understanding that you are free to withdraw your participation at any time. This DNP Project has been approved by Wright Patterson Air Force Base’s Intuitional Review Board (IRB) and has also obtained ceded approval from the University of Arizona’s IRB.

I sincerely thank you for your consideration and taking the time to participate in this DNP Project.

Very respectfully,

Elizabeth Gminski, MSN, RN
DNP Candidate
APPENDIX B:

DEMOGRAPHIC QUESTIONS
DEMOGRAPHIC QUESTIONS

1. What best describes your role at Wright Patterson Medical Facility?
   A. Family Practice or General Practice Physician
   B. Pediatrician
   C. Endocrinology Specialist
   D. Adolescent Medicine Specialist
   E. Nurse Practitioner
   F. Physician’s Assistant
   G. Other (Please specify): ______________________

2. How long have you been in practice?
   A. Less than 5 years
   B. 5-10 years
   C. 11-15 years
   D. 16-20 years
   E. 21 or more years

3. What is the highest level of education you have obtained?
   A. Baccalaureate degree
   B. Master’s degree
   C. Doctorate degree
   D. Post-doctoral education
   E. Other health related degree (please specify): ______________________
   F. Other non-health related degree (please specify): ______________________

4. What best describes your affiliation with Wright Patterson Air Force Base Medical Center?
   A. Civilian provider
   B. Active duty military provider
   C. Reserve military provider
   D. Guard military provider
   E. Provider with previous military service

5. If you are or were a military provider, please state your rank and branch of military service
   A. Rank: __________________
   B. Branch of service: ________________
   C. Not applicable. I have no prior military service.
APPENDIX C:

SURVEY QUESTIONS
SURVEY QUESTIONS

Screening for Diabetes:

1. Within your practice, what screening modalities do you utilize to evaluate pediatric patients, ages 10-17, for T2DM? Please select all that apply.
   A. Growth charts, including the child’s BMI
   B. Evaluation of family history of diabetes, especially a 1st or 2nd degree relative
   C. Consideration of the child’s race/ethnicity as it relates to disease risk
   D. Maternal history of T2DM or gestational diabetes
   E. Patient history of preterm birth, low birth weight, or a birth weight of > 9 lbs.
   F. Patient history of hypertension, dyslipidemia, peripheral neuropathy or polycystic ovary disease
   G. Patient food and activity journals

Diagnosis of Diabetes:

2. Within your practice, what diagnostic criteria do you utilize to diagnose pediatric patients, ages 10-17, with T2DM? Please select all that apply.
   A. Obesity defined as a BMI in the ≥ 95th percentile for age and gender
   B. A child who displays symptoms of polyuria, polydipsia, or unexplained weight loss
   C. A child with a plasma glucose level of ≥ 200 mg/dl
   D. HbgA1c laboratory results above 6%

3. Within your practice, what is the likelihood you would refer a pediatric patient, aged 10-17, to a specialist with either suspected or confirmed T2DM?
   A. Definitely not
   B. Probably not
   C. Probably yes
   D. Definitely yes
   E. I am a provider who specializes in care of Type 2 Diabetic youth

Patient Health Care Access:

4. What barriers do you feel pediatric military dependents, ages 10-17, may face when accessing care through a MTF? Please select all that apply.
   A. Long wait times for medical appointments
   B. Availability of appointment times that are convenient for the youth’s school schedule
   C. The complicated referral process of the MHS
   D. Families frequently PCSing to new locations
   E. Military healthcare providers frequently PCSing to new locations
F. Beneficiaries’ misunderstanding or lack of knowledge regarding the services provided by the MHS
G. Other (Please Specify): __________________________________________________________

5. What do you feel is the biggest obstacle you face when providing care to pediatric military dependents ages 10-17? Please select all that apply.
   A. Family/caretaker level of knowledge regarding the disease process and need for lifestyle modifications
   B. Youth’s compliance with lifestyle modifications and medication regimen
   C. Lack of resources available to you as a provider
   D. Other (Please Specify): _______________________________________________________

6. Do you feel that there is a health disparity among MHS pediatric beneficiaries, ages 10-17, diagnosed with T2DM?
   A. Definitely not
   B. Probably not
   C. Probably yes
   D. Definitely yes

7. Of the following health disparity indicators, what do you feel applies to pediatric military dependents, ages 10-17, that obtain care through a MTF? Please select all that apply.
   A. The rank of the sponsor
   B. The level of education of the sponsor and family
   C. The socioeconomic status of the youth’s family
   D. The race/ethnicity of the youth and/or family seeking care
   E. Other (Please Specify): _______________________________________________________

**Clinical Practice Questions:**

8. I feel completely comfortable screening, diagnosing, and treating pediatric patients, ages 10-17, with T2DM.
   A. Strongly agree
   B. Agree
   C. Disagree
   D. Strongly disagree

9. Incorporation of Evidence Based Practice (EBP) is foundational in my practice.
   A. Strongly agree
   B. Agree
   C. Disagree
   D. Strongly disagree
10. Clinical Practice Guidelines are applicable to every day practice.
   A. Strongly agree
   B. Agree
   C. Disagree
   D. Strongly disagree

11. Clinical Practice Guidelines are readily available when caring for Type 2 Diabetic youth that receive care through the MTF.
   A. Strongly agree
   B. Agree
   C. Disagree
   D. Strongly disagree

12. My “go-to” source of information for the care of youth with T2DM is:
    (Please select all that apply):
    A. Google search engine
    B. Peer reviewed medical journals
    C. Epocrates, Medscape, or UpToDate
    D. Clinical Practice Guidelines
    E. Other (Please specify):______________________________________________
REFERENCES


