

Assessing the benefit of a multi-disciplinary team approach in treating diabetes in rural area

Abstract

The incidence of diabetic and diabetic related complications is about 17 percent higher in rural area. Lacs of proper diabetic education and/or proper insurance coverage with primary care doctor are thought to be the causes of high incidence of diabetic in rural area. A comprehensive diabetic care is needed for uninsured and underinsured diabetic patients to improve overall outcome of treatment. The purpose of this study was to evaluate multi-disciplinary approach to improve blood glucose, A1C, foot care, blood pressure, and diabetic education in medically underserved rural area. This is IRB-approved retrospective chart-reviewed study among diabetic patients attending RAM in Lee and Buchanan counties of Virginia in 2017. Multi-disciplinary team comprised of pharmacists, nurses, foot care specialists, and certified diabetes educators provided ABI's, DFE's, preventative foot and nail care education and foot and nail care, insulin and medication counseling, dietary and lifestyle counseling, blood pressure measurement, A1C and blood glucose testing and medication management. Patients will be followed at 6 and 12 months to monitor improvement in A1C, blood glucose, blood pressure, ABI index. A1C level is less than is 52.38% in patients with proper diabetic education. On the other hand patients with limited diabetic education have very low A1C percentage (22.22%). Limited diabetic education corresponds to higher A1C level (88.88%) in diabetic patients (Figure 1). Initial study found proper health education is essential for uninsured and underinsured diabetic patients in rural area. A clinically significant benefit to patient health may be achieved through diabetic education and services by multi-disciplinary healthcare team.

Keywords: glucose, A1c, hypertension, multi-disciplinary, hyperglycemia

Volume 5 Issue 2 - 2018

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Received: March 21, 2018 | **Published:** April 18, 2018

Abbreviations: ABI, ankle brachial index; FSGB, fasting state blood glucose, DFE: diabetic foot examination; RAM, remote area medical

Background

In medically underserved areas, such as rural southwestern Virginia, diseases such as diabetes are often left poorly treated, undertreated or not treated at all. Lack of access to care, heavy financial burdens and a high incidence of uninsured or underinsured patients are all contributory to the poor outcomes of diseases such as diabetes in rural areas.^{1,2} Financial hardship and lack of education related to healthy eating often makes it difficult for patients to comply with a "diabetic diet". This leads to unhealthy habits such as binge eating, fast food meals daily, and limited physical activity. Patients are often unaware of the changes and preventative measures that are necessary to help improve their outcomes, thus putting patients and their families at a greater risk of developing diabetes and cardiovascular disease.³⁻⁵ Uninsured or underinsured patients are often unable to receive routine screening exams and appointments necessary for diagnosis and management of diabetes. "Remote Area Medical (RAM)"s mission to prevent pain and alleviate suffering is fuelled by donors and volunteers who support the operation of mobile medical clinics that deliver free, high-quality vision, dental, and medical services to children, individuals, and families who do not have access or cannot afford a visit to a doctor.⁶ Virginia lies in the heart of the most economically distressed region of the United States. RAM's yearly event in Wise, Virginia sees thousands of local citizens who rely on the no-cost clinic for all of the health care needs. Buchanan County has a 1 to 30 primary

care clinician to patient ratio.⁷ According to Virginia State Health Rankings, Buchanan, Wise, Dickenson, Tazewell, and Lee Counties are amongst the worst in the state with regards to health outcomes. According to Virginia Pharmacists Association, Virginia has a current shortage of 133 physicians and has over 7,000 pharmacists who are ready to deliver care.⁸ It is imperative that we examine potential benefits of a multidisciplinary approach lead by pharmacists to help improve outcomes for the patients in these underserved areas.

Purpose

The purpose of this study is to evaluate approaches to improve blood glucose, HbA1c, foot care, BP, and diabetic education in medically underserved rural areas. Health education serves as a huge contributor to positive health outcomes. This study will show the correlation between health education and health status in the underserved rural area of Appalachia. The study examines the benefit of multiple disciplines treating indigent patients at outreach events and clinics in Rural Southwestern Virginia. At these clinics, the patients were treated and counselled by certified diabetes educators, nurse practitioners, pharmacists, and foot care specialists. Patients receive a variety of care and services including but not limited to, ABI's, foot care, diabetes education, dietary education, medication management, diabetic foot exams and insulin education. Baseline labs and physical exams are documented to include hemoglobin A1C, lipids, blood pressure, foot exam, and ABI. Labs and exams will be repeated at 6 and 12 months as part of follow-up. Participants will also complete a survey regarding diabetes knowledge at baseline and again at 6 and 12 months, thus solidifying their correlation.^{9,10}

Method

We examined 30 patients over a 6-month period, from June to December, 2017. A multi-disciplinary team comprised of pharmacists, nurses, foot care specialists, and certified diabetes educators provided ABIs, DFEs, insulin and medication counseling, dietary and lifestyle counseling, blood pressure measurement, A1C and blood glucose testing and medication management at Remote Area Medical clinics in Virginia. The first location was Jonesville, Virginia at the Lee County Remote Area Medical (RAM) and followed by Grundy, Virginia RAM event. The patients were organized into two categories: diabetic educated and having none to limited diabetic education. Diabetic education was measured by a 30 questions survey pertaining to the disease state. A high score of >80% correct answers were chosen as standard for labelling patients as being diabetic educated. Patients will be followed at 6 and 12 months to monitor improvement in A1C, blood glucose, blood pressure, ABI index. The study includes patients with

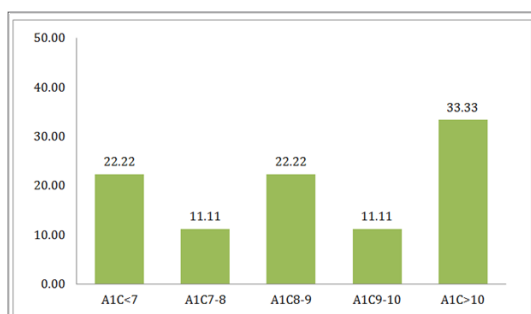


Figure 1 A1C level in patients with limited diabetic education.

Future direction

One of the major future directions of this study is to successfully communicate medical advice to patients using oral and visual presentation to convey vital medical information. We want to follow up every patient after 6 months and 12 months to evaluate the effect of counseling and diabetic education on life style modification.

Limitations of study

Small sample size limited our ability to detect a significant link between patients' literacy and chronic disease management. Our general approach to the study limited our ability to identify at risk populations. For example the elderly who are at greater risk of harm due to lack of education. Patients with higher health literacy may not necessarily be more knowledgeable of their disease process than low-literate patients, but just exhibited better confidence, or good at taking test.

Conclusion

The socioeconomic variation plays a vital role in incidences of diabetes and cardiovascular health risks. The American Diabetes Association reports that approximately 1.25 million Americans are suffering from diabetes, which is also a complication of cardiovascular risk problems, such as obesity and high blood pressure. Our study found a link between lack of education and decreased health outcomes. By supplying education to this underserved population, it is possible to reduce the health inequalities that are present.

A1C >6, FSBG >110 who are over the age of 18. Data was collected with patient consent and included phone numbers in order to follow up at 6 and 12 months intervals to assess intervention from our team.

Results and discussion

It was found that A1C level in diabetic patients is widely distributed among educated and non-educated patients. A1C level is less than is 52.38% in patients with proper diabetic education (Figure 2). On the other hand patients with limited diabetic education have very low A1C percentage (22.22%). Limited diabetic education corresponds to higher A1C level (88.88%) in diabetic patients (Figure 1). This data suggests an important association between education, diabetes, and cardiovascular disease risks. While it is difficult to directly compare the magnitude in education variation without fully knowing the extent of each population's educational background, the study is consistent with national evidence.

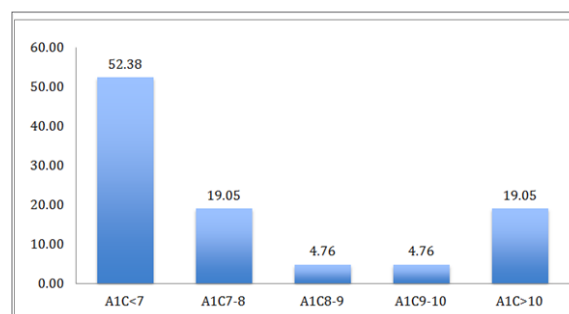


Figure 2 A1C level in patients with diabetic education.

Acknowledgements

None.

Conflict of interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

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