

# Identifying barriers that prevent US insured adults at-risk for and diagnosed with type 2 diabetes from accessing primary care services: An exploratory study

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## Abstract

**Introduction:** Type 2 diabetes is a condition that affects millions of individuals within the United States and it is one of the leading causes of death. Access to quality care is necessary to decrease the risk of developing type 2 diabetes and associated complications. This study focused on assessing the barriers that prevented insured individuals, identified through a community health screening as at-risk for or suffering from type 2 diabetes, from accessing primary care services.

**Methods:** A quali-quantitative design was used in this study. Participants were recruited through convenience sampling and 64 participants were identified through community outreach events sponsored by the Florida Atlantic University's (FAU) Community Health Center. Barriers were measured through the 'Barriers to Care' Survey Instrument, which was administered face-to-face at community outreach events.

**Results:** Descriptive analyses indicated that participants identified cost of care as the most reported barrier (73.4% of sample) to accessing care. Lack of family and friend support was the least reported barrier (7.8% of sample). Regression analyses showed a significant association between reported barriers and participants' access to primary care services by measuring participants' last primary doctor's appointment ( $R^2 = 0.47, P = 0.001$ ). Three factors significant resulted in predicting participants' last primary doctor's appointment: 'not having time to go to the doctor' ( $P = 0.022$ ), 'feeling too sad about disease to see a doctor' ( $P = 0.021$ ), and 'not feeling sick' ( $P = 0.001$ ).

**Discussion and Conclusions:** Findings have important clinical implications since addressing identified barriers can lead to increased access to primary care services and enhanced health outcomes. Future research should focus on the significant impact of self-management techniques, sociocultural factors, and psychosocial factors to help inform researchers how they impact the barriers associated with individuals at-risk for or suffering from type 2 diabetes. Having health insurance is not the only answer to accessing primary care.

**KEY WORDS:** Barriers to care; behavior; community health screening; diabetes mellitus; healthcare; health care system; primary care services.

## Riassunto

**Introduzione:** Il diabete mellito di tipo 2 è una patologia che interessa milioni di individui negli Stati Uniti d'America ed è una delle cause principali di morte. L'accesso alle cure di qualità è necessario per diminuire il rischio di sviluppare il diabete mellito tipo 2 e le complicanze associate ad esso. Questo studio si concentra sulla valutazione delle barriere che impediscono gli individui forniti di assicurazione sanitaria, identificati attraverso uno screening preventivo comunitario come soggetti affetti o a rischio di sviluppare il diabete mellito di tipo 2, di accedere ai servizi di cura primari.

**Metodi:** Un disegno misto quali-quantitativo è stato adottato in questo studio. I partecipanti sono stati arruolati attraverso un campionamento di convenienza e 64 partecipanti sono stati identificati attraverso programmi di formazione per la comunità sponsorizzati dal Community Health Center della Florida Atlantic University. Le barriere sono state misurate attraverso il questionario "Barriers to Care" somministrato di persona nel corso di programmi di formazione per la comunità.

**Risultati:** L'analisi descrittiva dei dati ha indicato che il costo della cura era la barriera principale per l'accesso alle cure riportata dai partecipanti (73.4% del campione). La mancanza di supporto da parte della famiglia e degli amici è risultata essere l'ultima barriera riferita (7.8% del campione). L'analisi di regressione ha mostrato un'associazione significativa tra le barriere riferite nel questionario e l'accesso da parte dei partecipanti ai servizi di cura primari valutati misurando l'ultimo incontro con il proprio medico di base ( $R^2 = 0.47$ ,  $P = 0.001$ ). Tre fattori sono risultati capaci di prevedere in modo significativo l'ultimo incontro con il medico di base: "non avere tempo per andare dal medico" ( $P = 0.022$ ), "sentirsi troppo tristi per la malattia per vedere un medico" ( $P = 0.021$ ), e "non sentirsi malati" ( $P = 0.001$ ).

**Discussione e Conclusioni:** I risultati hanno importanti implicazioni cliniche dal momento che affrontare delle barriere identificate può portare ad un incremento nell'accesso ai servizi di cura primari e ad un miglioramento degli "outcomes" relativi allo stato di salute. In futuro la ricerca si dovrebbe concentrare sull'impatto significativo delle tecniche di auto-gestione, sui fattori socio-culturali e sui fattori psicosociali per aiutare ad informare i ricercatori su come questi fattori impattano sulle barriere per gli individui che sono affetti o a rischio per diabete mellito di tipo 2. Possedere un'assicurazione sanitaria non è la sola risposta per l'accesso alle cure di base.

### TAKE-HOME MESSAGE

*There is a greater need for the provision of better healthcare for individuals at-risk for or suffering from type 2 diabetes. Having health insurance is not the only answer to accessing primary care.*

**Competing interests** - none declared.

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## INTRODUCTION

Diabetes affects about 25.8 million people in the U.S. and is the seventh leading cause of death [1], and an estimated 79 million have pre-diabetes [2, 3], which is approximately three times higher than the prevalence of type 2 diabetes mellitus (DM) [2]. Adequate screening and appropriate treatment is essential to reduce the morbidity and mortality associated with type 2 diabetes [4]. Access to quality health care has been a persistent issue among those who are medically underserved [5]; however, there are established barriers that prohibited individuals from accessing care that could lead to effective self-management if addressed [6]. Racial and ethnic minorities were found to be disproportionately affected by existing barriers to health care access and utilization, resulting in highly prevalent disparities [4]. In addition to minority racial and ethnic status, it has been identified that low socioeconomic status qualified as a risk factor for lack of access to specialty medical providers, low quality of preventive care, and lack of access to in-hospital or ambulatory care [4].

A systematic review found that acceptability of care is one of the major barriers that prevented adults with chronic diseases like diabetes from accessing care [7]. Acceptability was defined as 'the relationship between patients' attitudes regarding the personal and practice characteristics of current providers' [7]. Other identified barriers to care included: accommodation of schedule, availability of the patient and provider, and affordability of care [7]. Access to medical providers was also predicted by psychosocial factors such as social support in conjunction with one's belief in their ability to care for their diabetic condition [4].

Furthermore, health insurance, food insecurity, and self-efficacy were associated with barriers to healthcare access [4]. Although lack of insurance was found as a hindrance to accessing care [4], it was also identified that individuals with health insurance complained about the cost of co-pays and premiums, which resulted in less than quality care or incre-

ased periods without insurance coverage [8]. Some insured patients mentioned that the cost of their insulin and the strips needed for self-monitoring were too expensive [8]. Additionally, inadequate insurance coverage has been found to inhibit patient access to diabetes care [8]. As a result, some patients were affected by the inability to see the medical provider as scheduled [8].

Lack of health insurance [4] or inadequate insurance [8] have been identified as barriers for individuals with diabetes. In comparison to insured adults, research has found that uninsured adults suffering from diabetes experienced less access to health care as well as decreased levels of preventive care [9, 10]. Enhancing health care access can be addressed effectively through health care providers and policymakers expanding adequate insurance coverage for this population [10].

### *Statement of Problem*

Diabetes is a preventable disease that affects about 26 million people within the United States. Approximately three times that amount (79 million people) are at high risk for developing the disease. Those who have elevated glycemic levels are at high risk and are in need of outreach efforts and self-management strategies that are sustainable [11]. Although about 38% of people in the U.S. are considered pre-diabetic [2], only about 7% are aware that they have this risk [12]. If this condition is not treated in a timely manner, a large number of these individuals will develop type 2 DM as time progresses. With diabetes being the seventh leading cause of death in the U.S. [1], adequate care is necessary to decrease the risk of complications; however, the affordability of care has been identified as one of the major barriers for individuals accessing services [7].

Additionally, lifestyle modification such as proper nutrition and continuous physical activity is necessary for decreasing the risk of complications [14] and hospitalizations [15]. Outreach is used to outline a variety of activities such as the delivery of services or the distribution of information and educational

materials. It has been shown that outreach is effective in maximizing the benefit of risk-reduction efforts in order to reduce the number of new diabetes cases that occur yearly [16]. Outreach also helps individuals to become aware of their medical condition so they understand the need to seek appropriate care [17]. Outreach methods are important for encouraging diabetic and pre-diabetic individuals to seek primary care services [17]. It also decreases the risk of avoidable hospitalizations and decreases the patient's length of stay [15]. Therefore, it is vital that all of the individuals who can potentially benefit from outreach are targeted and identified [18, 19], as this will increase the effectiveness of risk-reduction efforts and its impact on the incidence of new diabetes cases [19].

The goal of outreach at the established internship site, Florida Atlantic University's (FAU) Community Health Center, is to identify sick or at-risk patients, and to encourage patients to access medical care. Although outreach is conducted, the site has found that individuals who have been identified as at-risk for developing diabetes, or are suffering from uncontrolled diabetes, have not consistently accessed primary care services. As these at-risk individuals are insured, the barriers to care are not well understood. Through application of the outcomes from the reviewed literature, this project aimed to examine the barriers that prevent insured adults at-risk for and diagnosed with type 2 diabetes from accessing primary care services.

### *Research Question and Hypotheses*

The following study was intended to address the research question and hypotheses below: What are the barriers that are preventing insured adults who are at risk for diabetes from accessing care once they have been informed that they are at risk?

H1: It is hypothesized that insured adults who are at-risk for or suffering from diabetes will report that cost of care is the most reported barrier to accessing primary care services, as measured by the 'Barriers to Care' Survey

Instrument.

H2: It is hypothesized that insured adults who are at-risk for or suffering from diabetes will report that lack of friend/family support is the least reported barrier to accessing primary care services, as measured by the 'Barriers to Care' Survey Instrument.

This study will also explore the barriers' impact on participants' access to primary care services as measured by the participants' last doctor's appointment and their blood glucose level.

## **METHODS**

### *Description of Setting*

The setting for this culminating project was based through the FAU Community Health Center (formerly known as Diabetes Education and Research Center), which is located in West Palm Beach, FL, U.S. The Center is managed by the Christine E. Lynn College of Nursing at FAU and the Gregory School of Pharmacy at Palm Beach Atlantic University. The Center utilizes education and treatment by a team of experts, including endocrinologists, nurse practitioners, educators, researchers, nutritionists, and pharmacists, to challenge the growing diabetes epidemic. The Center also provides support for individuals of all ages who are identified as at risk for developing diabetes, currently have diabetes, or are at risk of experiencing complications from the disease. Therefore, the Center offers education programs to the community, including: individuals, families, community organizations and neighborhood groups. They provide comprehensive services to individuals with or without the ability to pay. Programs provided include: Carbohydrate Counting, Diabetes and Pregnancy, Diabetes Self-Management Education, Insulin Pump Training, Kid and Teens Lifestyle Program, Medical Nutrition Therapy, and Medication Therapy Management. The Center's essential goal also comprises multidisciplinary education and training of college students in various professional disciplines; a particular emphasis is placed on nursing professionals.

### *Description of Population*

The targeted patient population for this study included insured adult patients who were either at-risk for or suffering from type 2 diabetes, which was identified through the site's glucose finger-prick screening process, participant self-report, and the American Diabetes Association's (ADA) Diabetes Risk Test, included in the outreach packet. The site considered a glucose level of 140 mg/dl and above to be abnormal (140mg/dl-299 mg/dl); a glucose level of 300 mg/dl and above was considered severe. Although some participants' levels may not be considered abnormal during screening, the ADA assessment conducted helped to determine if the participant was at increased risk for having type 2 diabetes through the following criteria: age, gender, diagnosis of gestational diabetes, family history of diabetes, diagnosis of hypertension, physical activity, and weight. Participants who scored a 5 or higher on the ADA assessment was considered at-risk; risk factors were added on the assessment to compute the score. Participants were excluded if they did not have an abnormal glucose level or were not considered at risk according to the ADA assessment. For the purposes of the study, no difference was made between patients who were either at risk for or diagnosed with type 2 diabetes.

Adults of all racial and ethnic backgrounds were included in the study. Since minorities are greatly affected by type 2 diabetes at a disproportionate rate and are at increased risks for the disease when compared to Non-Hispanic Whites, it was anticipated that there would be a larger number of minority populations, particularly African Americans and Hispanics. This is also representative of the population that is served at the Center: 50% African American/Black, 30% Hispanic/Latino, and 20% Caucasian/White. The Center also offers services on a sliding fee scale, accepting most insurance plans, which includes *Medicare* and *Medicaid*. Furthermore, insured adults include private coverage in addition to public medical programs. High deductibles

have been a challenge for many of the Center's patients, which has made it difficult for them to receive care elsewhere.

### *Procedures*

Individuals who agreed to be screened during outreach events sponsored by the FAU Community Health Center were approached to participate in the 'Barriers to Care' Survey. Once participants were contacted in-person at outreach events, individuals were offered a printed description of the planned study on the informed consent; informed consent was obtained verbally. It was projected that prospective participants would be contacted via telephone if they were screened at a past event; however, it was not necessary or practical once data collection commenced. Therefore, all participants were contacted in-person. Over a two month period (January to February 2016), potential participants were approached in order for the 'Barriers to Care' Survey Instrument to be administered. The questionnaire asked participants to identify information relating to their insurance status and the barriers that they faced while trying to access primary care services. Other information regarding the participants' demographics (age, gender, and race/ethnicity), glucose levels, ADA risk assessment, and their last primary doctor's visit was gathered from the site's outreach screening survey to incorporate into the findings. The researcher ensured that the surveys were understood, interpreted, and completed accurately. It was reinforced that the survey was voluntary and strictly confidential. Spanish and Creole interpreters were utilized, as necessary to accommodate the target population. Furthermore, patients were assigned unique participant ID numbers to maintain confidentiality.

### *Measures: The 'Barriers to Care' Survey Instrument*

The research utilized a survey instrument that assessed insurance type as well as barriers to care of participants. This 3-question survey included a 13-item scale that listed potential barriers that participants may face; the items

utilized a Likert-type scale ('Always Affected' to 'Not Affected at All') to evaluate the barriers listed. Data were analyzed through SPSS when frequencies were run. It totaled the amount of times a person checked that they are always, usually, sometimes or not affected by the particular barrier.

There was a version of the questionnaire for in-person completion of the survey and for telephone survey use, which was not utilized. Questions were developed based on the concept of the Perceived Barriers to Care Scale [20] as well as barriers that were predominantly identified within the literature.

Because the 'Barriers to Care' Survey Instrument is not an empirically validated instrument, the internal consistency of the instrument with this sample was calculated using Cronbach's Alpha ( $\alpha = .56$ ). Information regarding the participants' demographics (i.e. age, gender, and race/ethnicity), glucose levels, risk assessment, and participants' last primary doctor visit was assessed according to the associated outreach screening packet used by the site.

### *Data Collection*

Data collection commenced in-person after the culminating project proposal was approved by the researcher's formal committee. Arizona State University's Institutional Review Board determined this project to be exempt pursuant to Federal Regulations 45CFR46 [2]. During the months of January to February 2016, the researcher collected data from participants face-to-face at five outreach events at the following community partners of the FAU Community Health Center: Vickers House (South), Payne Chapel Missionary Church, Bath & Tennis Club, Gloria Y. Williams Multicultural Center, and St. Ann's Place. The identified site was informed of the study's outcomes.

### *Research Design*

In this one-time cross-sectional, mixed-design study, a convenience sample was utilized to identify potential participants who were being screened at community outreach events con-

ducted by FAU's Community Health Center. This design was also used to identify the most prevalent barriers reported to successfully accessing primary care services among the examined population. Since this research was exploratory, the researcher did not expect the results to be generalizable.

### *Data Analysis*

Data were coded and analyzed by SPSS, version 23.0 for Windows. All responses were assigned a corresponding numerical value. Descriptive statistics (i.e. frequencies) were utilized to examine the characteristics of participants and the barriers identified that could impact the organization. Multiple linear regression analyses were utilized to evaluate the identified barriers' impact on participants' access to primary care services. P values of less than 0.05 was accepted as statistically significant.

## **RESULTS**

### *Description of Sample*

Seventy-six participants were recruited to take the survey; however, only 64 participants' surveys were eligible for inclusion once responses were assessed for insurance and risk factors. The majority of participants were women ( $n = 41, 64.1\%$ ) as compared to men ( $n = 23, 35.9\%$ ). As shown in Table 1, participants' ages included individuals from 18 to 65+, with the vast majority of participants within the range of 50-64 years old (40.6%) and the second largest age group ranging from 65 and older (35.9%). The racial and ethnic background of participants included the following: 68.8% African American/Black ( $n = 44$ ), 15.6% Caucasians/White ( $n = 10$ ), 14.1% Hispanic/Latino (a) ( $n = 9$ ), and 1.6% Other ( $n = 1$ ).

All participants had insurance, the majority had private health insurance, including managed care plans (45.3%) and *Medicare* (28.1%), as illustrated in Table 2. Individuals who indicated 'Other' specified insurance through Health Care District of Palm Beach County (15.6%) and *Tricare* (1.6%).

All included participants were considered

**Table 1.** Age range in years ( $n = 64$ ).

Age	N	%
18-29	2	3.2
30-39	8	12.6
40-49	5	7.8
50-64	26	40.6
65 and older	23	35.9
<b>Total</b>	<b>64</b>	<b>100.0</b>

**Table 2.** Ways paid for medical care ( $n = 64$ ).

	N	%
Private health insurance/managed care plan	29	45.3
<i>Medicare</i>	18	28.1
Other (specify)	11	17.2
<i>Medicaid</i>	5	7.8
Veteran's Administration (VA)	1	1.6
<b>Total</b>	<b>64</b>	<b>100.0</b>

Note: The 'Other' category includes held insurance through Tricare and the majority held through Health Care District of Palm Beach County.

**Table 3.** Range of glucose levels for all participants considered at-risk through the ADA Assessment.

	N	%
Less than 140 mg/dl	42	65.6
140-299 mg/dl	18	28.1
300 mg/dl and above	4	6.3
<b>Total</b>	<b>64</b>	<b>100.0</b>

at-risk for type 2 diabetes by glucose levels or the ADA Diabetes Risk Test included in the outreach packet. Glucose levels are reported in Table 3.

### *Descriptive Statistics*

Descriptive statistics including frequency and percentage were computed for all outcome variables. Table 4 illustrates the 13 barriers and associated statistics representing participants' responses.

Table 5 illustrates the last primary doctor's appointment held by study participants.

### *Hypothesis 1: Most Reported Barrier to Care*

It was hypothesized that insured adults who

were at-risk for or suffering from diabetes would report that cost of care ('My copayments are too high or my insurance does not cover enough costs') was the most reported barrier to accessing care. In order to test this, descriptive analyses (frequencies) were conducted. Results show that this hypothesis was supported: Always affected = 13 (20.3%); usually affected = 23 (35.9%); sometimes affected = 11 (17.2%); did not affect = 17 (26.6%). Results indicated that the cost of care was the most strongly reported barrier by 47 participants, which was 73.4% of the sample. The second strongest reported barrier was 'The wait in the waiting room was too long,' reported by 29 participants, which was 45.4% of the sample.

**Table 4.** Reported barriers to care based on 13-item Scale on the ‘Barriers to Care’ Survey.

Items	4= Always Affected	3= Usually Affected	2=Sometimes Affected	1= Did Not Affect
I do not like/trust clinic staff	2 (3.1%)	2 (3.1%)	14 (21.9%)	46 (71.9%)
I do not like/trust my current doctor	4 (6.3%)	1 (1.6%)	14 (21.9%)	45 (70.3%)
The doctor's instructions are hard to understand	0 (0%)	1 (1.6%)	5 (7.8%)	58 (90.6%)
The wait in the waiting room is too long	6 (9.4%)	1 (1.6%)	22 (34.4%)	35 (54.7%)
Appointments are scheduled too far ahead	1 (1.6%)	0 (0%)	15 (23.4%)	48 (75%)
The cost of transportation and/or parking is too high	2 (3.1%)	2 (3.1%)	4 (6.3%)	56 (87.5%)
The clinic is too far away/no transportation	2 (3.1%)	2 (3.1%)	8 (12.5%)	52 (81.3%)
My insurance is too complicated to figure out	3 (4.7%)	1 (1.6%)	17 (26.6%)	43 (67.2%)
<b>My copayments are too high or my insurance does not cover enough of the costs</b>	13 (20.3%)	23 (35.9%)	11 (17.2%)	17 (26.6%)
I do not have time to go to the doctor	3 (4.7%)	1 (1.6%)	8 (12.5%)	52 (81.3%)
I do not feel sick	4 (6.3%)	2 (3.1%)	11 (17.2%)	47 (73.4%)
My friends and family do not support/help me	0 (0%)	0 (0%)	5 (7.8%)	59 (92.2%)
I feel too sad about my disease to see the doctor	1 (1.6%)	2 (3.1%)	13 (20.3%)	48 (75%)

Note: N (%). Total *n* = 64. Barrier indicating copayments are too high or insurance does not cover enough costs is in boldface to illustrate the most reported barrier.

**Table 5.** Reported last primary doctor’s appointment.

	N	%
Between 1-6 months	52	81.3
Between 6-12 months	4	6.3
Between 12-24 months	2	3.1
More than 24 months	3	4.7
Never/No response/Can't Remember	3	4.7

Note: Total *n* = 64

**Table 6.** Linear regression analysis of barriers impact on participants’ last doctor’s appointment.

	Beta	P
I do not have time to go to the doctor	0.281	0.022
I do not feel sick	0.466	0.001
I feel too sad about my disease to see the doctor	0.305	0.021

Note: Independent variables (predictor set): 13-item barriers to care scale. Dependent variable (outcome): Last doctor’s appointment.  $R^2 = 0.47$ ; predictor set is significant ( $P = 0.001$ ) when set at the  $<0.05$  level; *n* = 64.

**Table 7.** Linear regression analysis of barriers impact on participants’ glucose levels.

	Beta	P
I do not have time to go to the doctor	0.116	0.410
I do not feel sick	-0.185	0.245
I feel too sad about my disease to see the doctor	-0.023	0.879

Note: Independent variables (predictor set): 13-item barriers to care scale. Dependent variable (outcome): Glucose Levels.  $R^2 = 0.27$ ; predictor set not significant ( $P = 0.17$ ) when set at the  $<0.05$  level; *n* = 64.



### *Hypothesis 2: Least Reported Barrier to Care*

It was hypothesized that insured adults who were at-risk for or suffering from diabetes would report that lack of friend/family support ('My friends and family do not support me') would be the least reported barrier to accessing care, as measured by the 'Barriers to Care' Survey Instrument. In order to test this, descriptive analyses (frequencies) were conducted. Results show that this hypothesis was supported: Always affected = 0 (0%); usually affected = 0 (0%); sometimes affected = 5 (7.8%); did not affect = 59 (92.2%). Results indicated that lack of family/friend support was the least reported barrier by 5 participants, which was 7.8% of the sample. The second least reported barrier was 'The doctor's instructions are hard to understand,' reported by 6 participants, which was 9.4% of the sample.

### *Secondary Analyses*

#### *Regression*

Multiple linear regression analyses were conducted to evaluate the association of each individual barrier's impact on participants': 1) last primary doctor's appointment, measuring access to primary care services; and 2) blood glucose levels, measuring the self-management of glucose levels in people affected by diabetes. Information regarding participants' last primary doctor's visit and glucose levels was gathered from the site's outreach screening survey to incorporate into the findings. As shown in Table 6, the only significant predictor set was indicated between the barriers' impact on participants' access to primary care services, by measuring participants' last doctor's appointment:  $R^2 = 0.47$ ; the predictor set was significant ( $P = 0.001$ ), when  $P$  was set at the 0.05 level. There were three factors that were significantly associated with predicting participants' access to care: 1) 'not having time to go to the doctor' ( $P = 0.022$ ), 2) 'feeling too sad about disease to see a doctor' ( $P = 0.021$ ), and 3) 'not feeling sick' ( $P = 0.001$ ). Conversely, there was no significant impact of parti-

icipants' barriers on reported glucose levels, as shown in Table 7.

#### *Qualitative results*

Participants also had the option to respond to one open-ended question to discuss any additional barriers to accessing primary care services or expound on the barriers already listed. Additional barriers included the following: procrastination, feeling too lazy, bad weather, and the primary doctor prescribing too much medication. Of the barriers already listed, participants explained that they: 'had a fear of seeing their doctor' (1 participant), 'did not enjoy the experience' (1 participant), 'felt the doctor was impersonal', 'inattentive', and 'spent little time on their health' (7 participants), 'only went when they felt extremely sick' (2 participants), 'had great mistrust of doctors and medications due to seeing an ill family member suffer' (1 participant), 'felt the healthcare system was an "economic joke" and a "rip off"' (2 participants), 'were too depressed to adhere to appointments' (6 participants), and 'had too many out of pocket expenses' (11 participants).

## **DISCUSSION AND CONCLUSIONS**

It is well known that diabetes is one of the leading causes of death in the U.S.; therefore, adequate care is necessary to decrease the risk of developing type 2 diabetes and experiencing complications. Those who have elevated glycemic levels are at higher risk [11]. Identifying individuals who are at-risk for developing type 2 diabetes is essential for reducing their risk through targeted intervention strategies [19], including lifestyle and pharmacological interventions that can aid in the prevention or delay of complications [18]. However, the affordability of care, including the cost of copays and premiums, has commonly been identified as one of the major barriers for this population to access services [8]. Individuals with insurance also have not consistently accessed primary care services [8] and the barriers were not well understood. As a result, the study aimed to assess the barriers that were preventing insured adults

who were at risk for or suffering from diabetes from accessing care once they were aware of their risk-factor.

### *Significance of Findings*

This study focused on identifying the most prevalent barriers reported to successfully accessing primary care services among insured individuals at-risk for or suffering from type 2 diabetes. Descriptive analyses showed that the majority of participants felt that their co-payments were too high or insurance did not cover enough of their healthcare expenses. Even though participants experienced multiple barriers to care, the cost of care was the highest barrier reported. This finding is consistent with previous research. Other research has shown that individuals with insurance expressed significant concern about the cost of co-pays and premiums, which served as a hindrance to accessing care [8]. Inadequate insurance also accounts for barriers [8], which was consistent with this study's findings as some participants expressed that they could not afford diabetes strips and medications.

In addition, it is possible that participants with insurance still had issues with the cost of care due to other sociocultural factors such as household size and job type since this study did not measure that. Since sociocultural factors can impact the access that individuals have to primary care, it is important that future studies regarding barriers among those with type 2 diabetes include valid measures to assess the association among these factors.

### *Comorbid Behavioral Health Conditions Associated with Diabetes*

About 25% of participants expressed that they were 'too sad about their disease to see a doctor.' This may suggest that participants could be experiencing various mood disorders such as depression that may have impacted their physical conditions as well as their ability to access services. The research has shown that depression or distress can have an adverse impact on diabetes and that there is a bidirectional impact of these comorbid conditions; major depression has been found to

occur in approximately 12% of diabetic patients [21]. Comorbid conditions lead to poor self-care and medical complications. People with diabetes may experience high levels of stress [22] that include feeling overwhelmed by the demands of living with diabetes and not feeling like they have enough emotional support from family, friends, and healthcare professionals [23]. However, the study did not analyze mental health disorders such as depression through specific instruments such as clinical examination and psychometric tests to make a medical diagnosis.

An individual's perceived lack of social support was also identified as a barrier to effective self-management [8]. Conversely, the study showed that lack of social support was the least self-report type of barrier to primary care services. Peer support, provided by non-professionals who are suffering from diabetes and/or closely affected by the condition, can provide the type of ongoing care necessary for this population to sustain their self-management skills [24]. Some of the main factors needed for peer support to be effective include the provision of: daily management assistance, emotional and social support, and linking patients to medical and behavioral care services. Peer-led interventions also enhance self-management strategies; however, the programs that garner the most success are resource-intensive, such as the provision of peer educators to assist with ongoing care [24, 25]. Therefore, there is an increased need for integrated care services that target the physical, mental, and behavioral health conditions in individuals at-risk for or suffering from chronic diseases.

### *Additional Findings*

The findings confirm the critical role health insurance plays in regular doctor's visits. Adequate screening, appropriate treatment [4], and effective self-management [6] are essential to reducing morbidity and mortality rates associated with type 2 diabetes. In order to achieve target health outcomes, barriers must be identified and addressed. Interventions that are developed to address these barriers

have proven to be effective in decreasing one's risk for developing type 2 diabetes or reducing complications among type 2 diabetic individuals [11].

However, there is still a gap that needs to be addressed since individuals with insurance are still experiencing barriers due to high associated costs. Although the majority of participants in this study reported that they attended a doctor's appointment within the last six months, other respondents recounted that their last appointment was longer than 12 to 24 months ago. The multiple linear regression analyses showed that there was a significant impact of barriers on participants' access to primary care services. Since these three factors significantly impacted access to care ('not having time to go to the doctor,' 'feeling too sad about disease to see a doctor,' and 'not feeling sick'), there is a greater need to delve deeper into the biopsychosocial factors that influence individuals.

Other self-reported barriers included the length of time spent in the waiting room, not liking or trusting clinical staff, not liking or trusting the doctor, and insurance too complicated to figure out. Some participants who indicated cost as a factor held specific insurance with certain restrictions such as seeing doctors or staff at only one primary clinic. Individuals who held coverage through the county reported this situation. This type of restriction sets limits on access to care [8], and may also impact the quality of care since these patients only have the choice of seeking primary care at a particular clinic or obtain no primary care services at all. Since participants reported not liking or trusting clinical staff and the doctor as barriers, it is possible that there is a need to research why there is a disconnect between patients and providers regarding the provision of quality, efficient care. Poor communication with providers may be a factor [6].

### *Alternative Explanations of Results*

Almost 35% of participants had a glucose level of either abnormal or severe. According to the ADA Diabetes Risk Test, other

risk factors that participants experienced included some or all of the following: increased age, gender type, diagnosis of gestational diabetes, family history of diabetes, diagnosis of hypertension, lack of physical activity, and elevated weight. Although cost was a significant barrier to care, the lack of appropriate self-management is also a factor to consider regarding this population's access to care [17, 24]. Appropriate diet, exercise, and adherence is essential to decreasing risk levels and managing disease [26].

### *Study Strengths*

Surveys were anonymous through the assignment of a patient ID; therefore, participants were possibly more inclined to answer the questions truthfully. There was also a mix of men and women included in the sample. The survey format was strong since it assessed multiple issues (i.e. barriers faced, insurance type, and glucose levels). Furthermore, additional factors, such as participant demographics and last primary doctor's appointment were collected in order to analyze their impact on access to primary care.

### *Study Limitations*

#### *Generalizability*

Although this study identified quality information and trends, there was no random selection of participants. Instead, the study utilized a convenience sample from the individuals who were screened by the outreach team through FAU's Community Health Center. Therefore, the results of the study cannot be generalized to all individuals at-risk for or suffering from type 2 diabetes since the results of the study are specific to insured participants in the West Palm Beach area. Additionally, a smaller sample size may have impacted the explanatory power of conclusions.

#### *Data collection method*

Surveys were conducted face-to-face at outreach sites where screenings were conducted. Recruited participants were asked about their barriers to care. Although participants were

assured of the confidentiality of their responses, they may or may not have felt compelled to be completely honest about some of the barriers they face while trying to access primary care services. A small number of participants may have experienced a language barrier since they only spoke Spanish. Although interpreters were available to explain the survey, its purpose, and the questions assessing barriers experienced, some information may have been lost in translation. To minimize this issue, prior to data collection, interpreters were briefed on survey questions as well as the information seeking to be collected.

### *Bias*

The responses in this study were based on self-reporting, which was inevitable since the project was centered on the clients' voluntary participation to give their perspective on the barriers that they faced while trying to access care. Response bias may have played a role since some participants may have felt uncomfortable discussing the type of barriers they experienced. However, this was accounted for by asking questions in a non-leading manner and assuring confidentiality during collection and anonymity afterward since all surveys were assigned a patient ID.

### *Clinical Implications of the Findings and Conclusions*

Findings suggest a greater need for the provision of better healthcare for individuals in need. Having health insurance is not the only answer to accessing care. The cost of diabetes on the healthcare system is exceptionally high and the costs for diabetic patients compared to those without this illness is twice as high [1].

From recent reports, the approximate cost of diabetes to the U.S. healthcare system is \$245 billion [2, 13]; with indirect and direct costs totaling \$176 and \$69 billion, respectively [2]. Individuals who are diagnosed with this illness incur an average amount of \$13,700 in medical expenses yearly. Additionally, the biggest factors contributing to the amount of direct medical costs were prescription medi-

cations and hospital inpatient care. The greatest contributing factors to indirect costs were decreased work productivity and increased absenteeism [2].

A closer look at the type of care and the quality of care provided is imperative for individuals at-risk for chronic diseases to focus on prevention. This will aid in the reduction of the financial burden on the healthcare system as the number of individuals utilizing the emergency department and being hospitalized will decrease with this increased focus on prevention.

### *Suggestions for Further Research*

In addition to the aforementioned findings, self-management strategies were important to the barriers that participants faced. Implementing a high-impact national educational awareness campaign that focuses on prevention messages geared toward individuals with pre-diabetes is included in the American Diabetes Association's strategic plan for improving self-care strategies [27]. Evidence-based interventions that support lifestyle change and encourage patient engagement have proven most effective [16]. Programs are also most efficient when both the patient and provider have discussed these strategies and have shared in the decision-making process through collaborative care [11].

Provider recommendations were associated with patient increase in engaging in healthier behaviors to sustain lifestyle modifications [28]. Moreover, interventions that specifically focused on the development and enhancement of these self-care skills, such as the promotion of positive attitudes through proper nutrition and exercise [26], helped reduce the risk of diabetic and pre-diabetic individuals from experiencing complications. Furthermore, essential skills including improvement of knowledge regarding diabetes and its effects, specific goal-setting, healthy cooking recipes, focus on problem-solving, grocery shopping skills, and adequate self-monitoring [26] are specific examples of strategies that helped improve self-care.

Future research should focus on the significant

impact of self-management techniques with the types of barriers encountered in this study, such as not having time to go to the doctor and not feeling sick. Finding a way to address self-management could help empower individuals to focus on prevention methodologies. Furthermore, addressing sociocultural factors such as socioeconomic status, household size, and job type will help inform researchers how these also impact the barriers associated with individuals at-risk for or suffering from type 2 diabetes and other chronic illnesses. Since not liking or trusting the doctor and clinical staff were reported barriers to care, research that delves deeper into the type of care and the quality of care provided is necessary. Possible interventions that help increase the competency or interpersonal skills of healthcare professionals may help decrease patient skepticism and mistrust of the healthcare staff and system [29], resulting in an increase in

the likelihood of this population accessing primary care services. The study aimed to assess the barriers that were preventing insured adults who were at risk for or suffering from diabetes from accessing care once they were aware of their risk-factor. Finally, the findings found will help the intern's site, FAU Community Health Center, to address identified barriers to support the increase in access to care for current and new patients.

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