Improving the Identification of Undiagnosed Diabetes in Primary Care

Katherine H Hooker

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Approved by:

Dr. Michelle Ollis, DNP, FNP	DNP Chair
Dr. Judy Phillips, DNP, FNP	Committee
Jessica Steelman, FNP	Stakeholder

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Abstract

Background: Over 30 million Americans suffer from diabetes, and over 80 million Americans suffer from prediabetes and is underdiagnosed within the United States. Early identification for diabetes conditions, such as using a risk assessment tool, can reduce the medical cost for patients and practices. This serious, debilitating disease can lead to an increased risk of complications (including stroke, heart disease, kidney failure, foot infection leading to amputation, and even blindness).

Purpose: The purpose of this quality improvement (QI) project was to determine if the implementation of a diabetic screening tool known as the American Diabetes Risk Test (ADADRT), in the primary care setting by providers can help providers and patients diagnose diabetes early, and/or prevent it, most importantly.

Methods: A quantitative design method utilizing a retrospective chart review was conducted on patients seen at the practice for the three months before the ADADRT implementation and after to evaluate for both the primary and secondary outcomes of the QI project.

Results: An independent sample t-test was performed to determine whether there was a significance between the ADADRT score and if patients should have proper further testing if needed. The result of the two-tailed independent samples t-test was significant based on an alpha value of .05, $t(58) = 12.65$, $p < .001$. Another independent sample t-test was performed analyzing if there was a significance between the ADADRT score and actually administering the tool itself. The result of the two-tailed independent samples t-test was significant based on an alpha value of .05, $t(54.48) = -4.38$, $p < .001$

Recommendations and Conclusion: ADADRT is an effective tool for identification of prediabetes and Type II Diabetes (T2DM) and a valuable resource for providers to incorporate evidence-based treatment plans to prevent or alter the progression of diabetes.

Keywords: prediabetes, diabetes, primary care, risk assessment screening tool, united states

Improving the Identification of Undiagnosed Diabetes in Primary Care

Type II Diabetes Mellitus (T2DM) is one of the leading causes of death in the US. Diabetes is a major US public health burden, affecting over 30 million adults, with an expected prevalence of beyond 54 million by 2030. Diabetes accounted for over $230 billion in direct medical costs in 2017 (Kazemian et al., 2016). In 2018 the Centers of Disease Control (CDC) estimated over 34 million people of all ages within the US population had diabetes. Over seven million adults aged 18 years or older, who met laboratory criteria for diabetes, were not aware of or did not report having diabetes (Kazemian et al., 2016). The percentage of adults with diabetes increased with age, reaching over 26% among those aged 65 years or older (Kazemian et al., 2016).

Amongst the lab values already mentioned for a diagnosis, diabetes can present with many kinds of symptoms that can go unnoticed by patients, and even providers. Clinical presentation of T2DM can include all or just some of the following symptoms: polyuria, polydipsia, polyphagia, fatigue, vision changes, paresthesia, and recurrent infections (Kazemian et al., 2016). Many other disease processes can present very similar which could cause a misunderstanding of a diabetes diagnosis if not properly screened/tested for. Patients that have T2DM are at an increased risk for life-changing complications such as heart failure, renal failure, and *death.*

Early identification of patients that are at risk for diabetes provides not only an opportunity for providers to educate patients on the disease itself, but it also allows an early beginning of evidence-based treatment plans that can prevent or alter the progression of diabetes (Kazemian et al., 2016). Early identification for diabetes conditions, such as using a risk assessment tool, can also reduce the medical cost for patients and practices in the long run (Kazemian et al., 2016). Healthcare cost for diabetic patients is usually over two times as much than those without diabetes, leading to over 320 billion dollars a year spent on those with a diabetes diagnosis, which calculates to approximately over $9,000 a year for each patient, each year (ADA, 2018).

Purpose

The purpose of this quality improvement (QI) project was to determine if the implementation of a diabetic screening tool, ADADRT, in the primary care setting by providers can help providers and patients catch diabetes early, and/or prevent it, most importantly. Another goal of this project was to increase the use of the screening tool in primary care practice.

Review of Current Evidence

A review of literature was performed to further examine and evaluate current evidence regarding identifying patients for diabetes using databases including but not limited to: CINAHL and PubMed. Search terms used were prediabetes, diabetes, primary care, risk assessment screening tool, united states.

Risk Assessment Tools

The American Association of Clinical Endocrinologists (AACE) and the American Diabetes Association (ADA) state that screening for diabetes and prediabetes is very important because prediabetes has no classic signs or symptoms (Bernabe-Ortiz et al., 2018). Without effective screening programs, people with prediabetes are unlikely to take the necessary steps to prevent progression to T2DM (Bernabe-Ortiz et al., 2018). Providers may not even use a screening tool and if they do, it is computerized before the patient's visit. This computerized approach can however save time for practitioners who provide preventive services, but this effects the patient's understanding of what the screening tool is actually saying and the score they receive (Hussain et al., 2007). There are simple and affordable tests that can be used for screening, in person, and there is fortunately enough time between the appearance of risk factors and disease development to make such screening an effective tool for prevention (Bernabe-Ortiz et al., 2018).

Finnish Diabetes Risk Score (FINDRISC) is a prediction tool to identify patients at risk of developing diabetes. It requires no laboratory testing and has been validated in multiple populations. FINDRISC uses age, BMI, physical activity, vegetable & fruit intake, medical treatment of hypertension, history of hyperglycemia and family history to determine risk of developing diabetes (Bernabe-Ortiz et al., 2018). By using FINDRISC to identify high-risk people and applying an educational intervention, it has been deemed possible to reduce the incidence of diabetes. Unlike other tools, the FINDRISC had a

moderate performance for T2DM screening in mainly the Peruvian population (Bernabe-Ortiz et al., 2018).

Australian Type II Diabetes Risk Assessment Tool (AUSDRISK) is a screening tool used to identify individuals at high risk of developing T2DM for entry into lifestyle modification programs. Unlike other tools, according to studies, AUSDRISK should be used in conjunction with oral glucose tolerance testing, fasting glucose, or glycated hemoglobin to identify those individuals at highest risk of progression to T2DM (Malo et al., n.d).

The ADADRT was originally developed from a risk prediction model using nationally representative data from the National Health and Nutrition Survey (NHANES) 1999–2004 and includes easily answered health-related questions (Mohd et al., 2022). Validation of this risk model was based on 2005–2006 data from the same source, in addition to the baseline data from two large cohorts, the Community Atherosclerosis Risk Study and the Cardiovascular Health Study (Mohd et al., 2022). The ADADRT reported 79% sensitivity, 67% specificity, 10% positive predictive value (PPV), 99% negative predictive value (NPV) and area under the receiver-operating characteristic curve (AUROC) of 0.83 (Mohd et al., 2022). The ADART is shown to be effective, budget neutral, and patient-centric and has been recognized to assist PCPs with prediabetes screening and diagnoses for prompt and efficient intervention (Marshall & Broome, 2017). The ADADRT is an easy-to-implement diabetes screening score that demonstrates improvements over existing methods (Bang et al., 2009). Screening for prediabetes and Type II diabetes risk through an informal assessment of risk factors or with an assessment tool, such as the ADADRT, is recommended to guide providers on whether performing a diagnostic test is appropriate (Draznin et al., 2022).

Prevention

The interest in preventing diabetes through lifestyle changes was already present in the 1980s. However, diabetes continued to worsen, therefore the opportunity to prevent T2DM through lifestyle changes was re-emphasized in the 2004 recommendations of the Diabetes and Nutrition Study Group (DNSG) of the European Association for the Study of Diabetes (EASD) (Uusitupa et al., 2019). T2DM is

preventable, or its onset can be postponed, by increasing physical activity, reducing weight, and changing dietary habits (Uusitupa et al., 2019). Based on analyses of randomized controlled trials, it can be concluded that lifestyle changes, in general, results in the better long-term prevention of T2DM (Uusitupa et al., 2019). However, based on the evidence coming from observational studies on T2DM risk factors with the remarkable beneficial effects of weight reduction on glucose metabolism, weight reduction has been considered as a cornerstone in the prevention of T2DM (Uusitupa et al., 2019). Some studies have shown that adherence to plant-based dietary patterns are also associated with a lower risk of T2DM incidence as well (Uusitupa et al., 2019).

Risk Factors

T2DM is a serious, yet common chronic disease resulting from a complex inheritance-environment interaction along with other risk factors such as obesity and sedentary lifestyle (Urrutia et al., 2021). T2DM is often thought to be caused in an individual from an interaction between several lifestyle, medical condition, hereditary, psychosocial and demographic risk factors such as high-level serum uric acid, sleep quality/quantity, smoking, depression, cardiovascular disease, dyslipidemia, hypertension, aging, ethnicity, family history of diabetes, physical inactivity, and obesity (Ismail et al., 2021). Sleep quantity/quality, smoking, dyslipidemia, hypertension, ethnicity, family history of diabetes, obesity and physical inactivity are strongly associated with the development of T2DM as well. (Ismail et al., 2021)

Complications

In the 90s, the time before diagnosis was estimated to be up to 10 years. Dyslipidemia, hypertension, and obesity are associated with prediabetes and T2DM (Trikkalinou et al., 2017). Hyperglycemia can cause functional and structural damages which might further lead to macrovascular and/or microvascular complications during this period of undetected disease (Trikkalinou et al., 2017). Unfortunately, it has been reported that a sizable proportion of subjects with newly diagnosed T2DM already have chronic complications (Bonora et al., 2020). Sadly, over 230 individuals with diabetes suffer from an amputation daily, which are usually caused by a non-healing diabetic foot ulcer (Bora et al., 2020).

Translational Framework

The QI framework known as Plan-Do-Study-Act is what guided the implementation of this project (IHI, 2022). For example, during the planning stage, an evidence-based screening tool was selected, researched and constructed a literature review with such, to identify patients at risk for diabetes. Also, during the planning stage, meetings were held with the stakeholder during clinic hours and discussed ideas in the practice that should be addressed and improved. The research/implementation team was then formed, in regards to, who could administer the tool to patients and when. During the do/implementation stage, the screening tool was implemented into the clinical practices process. In the study stage, a data analysis was completed to further investigate the tool and how it has improved the identification of diabetes risk in the study. And most importantly, the act stage completes this framework and places this tool as a part of routine care in this practice including but not limited to, placing this tool in the EHR.

Health Belief Model

The health belief model (HBM) was one of the first models to adapt theory from the behavioral sciences to health problems, and it remains one of the most widely used conceptual frameworks of health behavior, since the 1950s (Norman & Conner, 2017). The HBM was based on an assumption that people fear diseases, and that health actions are motivated in relation to the degree of fear (Norman & Conner, 2017). Having patients directly see their risks for T2DM on the screening tool can directly impact their motivation to do better with prevention of this disease, but many others. HBM can play an important role in interventions for patients with clinical nutrition-related risk factors, such as high cholesterol or diabetes (Norman & Conner, 2017). For provider use, when using the health belief model, it is most likely to be influential to patients when they a tool is provided in a clear and specific manner, placed in the context of overall risk for diseases, such as the ADADRT screening tool (Norman & Conner, 2017).

Methods

Design

This was a four-month quantitative quality improvement (QI) project intended to increase the use of diabetic screening tools and diagnose pre-diabetes or diabetes early in patients by providers. Prior to implementation, no diabetic education or resources were provided to patients by the providers at their routine appointments unless their Hemoglobin A1C was checked and then resulted abnormal.

Population

The primary population was a sample of two primary care practitioners, located in a primary care office in a rural area of North Carolina. The inclusion criteria included a provider, employed in a primary care office who provides direct patient care, including annual wellness visits, to patients in the office**.** Exclusion criteria was any provider who did not provide direct patient care including annual wellness visits and not willing to participate in the QI project, and any staff in the office that was not considered a provider.

The patient population inclusion criteria were: non-pregnant, 18 years and older, and without a current diabetic-related diagnosis, who presented for an annual wellness visit. Exclusion criteria was pregnant females, patients less than 18 years of age, and a pre-diabetic or diabetic-related diagnosis.

Setting

The QI project took place in a primary care practice in rural North Carolina serving patients of all ages. The practice included two nurse practitioners, two nurses, one pharmacist, and one pharmacy technician staff with an off-site supervising physician.

Ethical Considerations

Approval from the Institutional Review Board (IRB) of Lenoir-Rhyne University in Hickory, NC was obtained prior to project implementation. No patient identifying information was obtained and strict adherence to the Health Insurance Portability and Accountability (HIPAA) guidelines were met in order to protect patient privacy. Data that was collected was placed on a password-protected computer.

Intervention and Data Collection

An in-person meeting was held with all the providers willing to participate in the QI project. In the meeting, copies of the ADADRT tool (See Appendix A) were distributed to providers and information was given to providers on how to interpret the scores, with recommended testing, based on a score of five or greater. In the meeting, the importance of the screening tool was presented to the providers using literature review, and what would be done if a patient does score to be pre-diabetic or diabetic. Providers were taught how to follow up with the information received from this screening tool of the patients, whether it be ordering further testing etc.

The screening tool was given to the patients meeting inclusion criteria when they arrived to the office. The screening forms only used two identifiers: the patient's initials and BMI. A score of five or more on the screening tool suggest an increased risk for Type II diabetes.

A retrospective chart review on patients seen at the practice for the three months before the ADADRT implementation. Patients meeting the same inclusion criteria, non-pregnant, 18 years and older, and without a current diabetic-related diagnosis, were assigned an ADADRT score using patient chart information. For further comparison and during implementation, patients aged 18 and over, without a current diabetic-related diagnosis, completed the ADADRT upon arrival for primary care appointment. Patients that scored higher five or higher on the ADADRT were educated on the disease, and they were referred to lab for further testing of either a Hemoglobin A1C or fasting plasma glucose (FPG) within the judgement of the provider. Patients with abnormal lab values that could indicate potential diagnosis of diabetes were scheduled a follow-up appointment at the earliest convenience.

Data Analysis

Variables measured: BMI, gender, age, A1C, and if education was given. Data was differentiated by the intervention (toolkit), indicating yes or no. This project was designed to determine if the effects of a diabetic toolkit changed the determination of a provider to initiate education and further testing for diabetes in asymptomatic individuals at routine visits. The data generated from the study was interpreted using an independent samples t-test in the Status Intellectus program. Pre and post implementation data

were created and then compared with retrospective chart reviews, which is the intervention indicated in the dataset.

Descriptive Statistics

There were a total of 60 participants in this project (n= 30 in pre intervention group, and n = 30 in post intervention group). The average BMI was 27.8 (*n* = 3, 5.00%). The majority of the patients did not have their Hemoglobin A1C checked (*n* = 40, 66.67%). Furthermore, the majority of the patients did not receive education regarding a new potential diabetic diagnosis (*n* = 40, 66.67%). The average age in both groups was 50.88 (range 18-85 years). The majority were female (n = 37, 61.67%). The average ADADRT score was 5.27. The summary statistics can be found in Table 5.

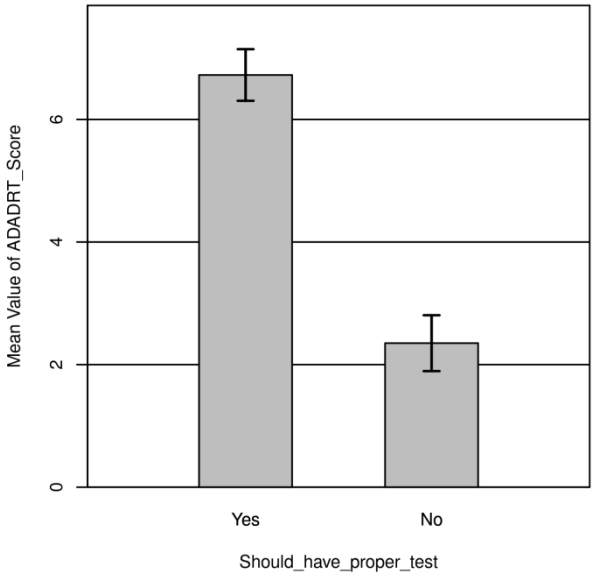
Table 5
Summary Statistics Table for Score and Age Variables

Variable	*M*	*SD*	*N*	SE_M	Min	Max	Skewness	Kurtosis
Age	50.88	17.17	60	2.22	18.00	85.00	-0.16	-0.98
ADADRT Score	5.27	2.43	60	0.31	1.00	10.00	-0.21	-0.89

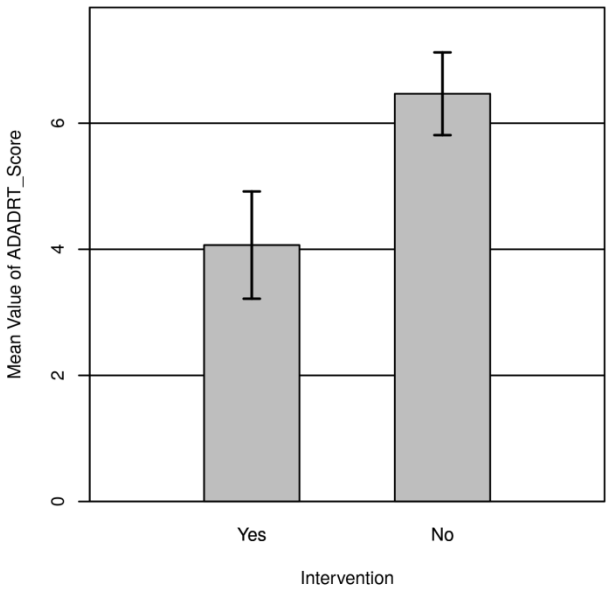
Note. '-' indicates the statistic is undefined due to constant data or an insufficient sample size.

Results

An independent sample t-test was performed analyzing if there was a significance between the ADADRT score and if patients should have proper further testing if needed. The result of the two-tailed independent samples t-test was significant based on an alpha value of .05, $t(58) = 12.65$, $p < .001$. This finding suggests that the averages of ADADRT Score (continuous variable) was significantly different between the Yes and No categories of whether the patient should have testing (Yes) (Hemoglobin A1C) or not (No) (independent variable) based on ADADRT score (See bar plot below).



Another independent sample t-test was performed analyzing if there was a significance between the ADADRT score and actually administering the tool itself. The result of the two-tailed independent samples t-test was significant based on an alpha value of .05, $t(54.48) = -4.38$, $p < .001$. This finding suggests the averages of ADADRT Score (continuous variable) was significantly different between the Yes and No categories of Pre-intervention/Chart review (No) or tool administered to patient (post intervention) (Yes) based on ADADRT score (See bar plot below).



Discussion

The implementation of the ADADRT determined that there was a significant improvement in the pre-intervention group and post-intervention group leading to identifying pre-diabetes and diabetes in some patients. Anticipated findings were that the use of ADADRT screening tool would increase the provider's awareness while improving patient's outcomes, regarding early identification of diabetes. Unanticipated findings were that most of the population were female and that most patients did not have a Hemoglobin A1C checked at their annual wellness appointment. These results could be due to poor sample selection of the staff members out of the total of patients coming into the primary care practice, or simply that more patients are female that seek routine, preventative care (compared to men).

Limitations

One limitation of this project was the small sample size for the primary outcome. There were only two providers within the practice who implemented the screening tool, and who were able to determine if the patient should have further testing. Another limitation was the short timeframe allowed for the screening tool to be implemented.

Conclusion

In 2018 the Centers of Disease Control (CDC) estimated over 34 million people of all ages within the US population had diabetes. Over seven million adults aged 18 years or older, who met laboratory criteria for diabetes, were not aware of or did not report having diabetes (Kazemian et al., 2016). Diabetes often goes undetected for many years without a patient or their provider knowing. As the risks associated with diabetes are informative, providers can be doing more to help detect and diagnose diabetes early despite being asymptomatic. Most providers use computerized screening tools in primary care to save time on the administering process versus actually taking the time to explain the screening tool with the patients (Hussain et al., 2007).

The QI project and screening tool process was successful in improving provider and patient knowledge involving early identification and diagnosing of T2DM. Due to the implementation of the

ADADRT screening tool, providers also provided appropriate evidence-based educational resources to their patients. This QI project was performed in an effort to improve patient outcomes in a rural North Carolina practice, with hopes of other practices doing the same in the surrounding areas. Results from this QI project supports that diabetic screening tools should be administered at every encounter to non-pregnant patients above eighteen years old, especially the ADADRT.

References

Bernabe-Ortiz, A., Perel, P., Miranda, J. J., & Smeeth, L. (2018). Diagnostic accuracy of the Finnish Diabetes Risk Score (FINDRISC) for undiagnosed T2DM in Peruvian population. Primary care diabetes, 12(6), 517-525.

Bang, H., Edwards, A. M., Bomback, A. S., Ballantyne, C. M., Brillon, D., Callahan, M. A., ... Kern, L. M. (2009, December 01). Development and validation of a patient selfassessment score for diabetes risk. Annals of Internal Medicine, 151(11), 775-783.

Bonora, E., Trombetta, M., Dauriz, M., Travia, D., Cacciatori, V., Brangani, C., ... & Bonadonna, R. C. (2020). Chronic complications in patients with newly diagnosed type 2 diabetes: prevalence and related metabolic and clinical features: the Verona Newly Diagnosed Type 2 Diabetes Study (VNDS) 9. BMJ Open Diabetes Research and Care, 8(1), e001549.

Draznin, B., Aroda, V. R., Bakris, G., Benson, G., Brown, F. M., Freeman, R., ... & Kosiborod, M. (2022). 2. Classification and diagnosis of diabetes: standards of medical care in diabetes-2022. Diabetes Care, 45(Supplement_1), S17-S38.

Ely, E. K., Gruss, S. M., Luman, E. T., Gregg, E. W., Ali, M. K., Nhim, K., ... & Albright, A. L. (2017). A national effort to prevent type 2 diabetes: participant-level evaluation of CDC's National Diabetes Prevention Program. *Diabetes care*, *40*(10), 1331-1341.

Hussain, S., Taylor, M., Waltermaurer, E., McCauley, J., Ford, D. E., Campbell, J. C., & McNutt, L. A. (2007). Computer-administered screening of reproductive-aged women for diabetes risk in primary care settings, feasibility and acceptability of such screening, and validity of risk assessments based on self-reported weight. Preventing chronic disease, 4(3), A54-A54.

Kazemian, P., Shebl, F. M., McCann, N., Walensky, R. P., & Wexler, D. J. (2019). Evaluation of the cascade of diabetes care in the United States, 2005-2016. *JAMA internal medicine*, *179*(10), 1376-1385.

Kianpour, F., Fararouei, M., Hassanzadeh, J., Mohammadi, M., & Dianatinasab, M. (2021). Performance of diabetes screening tests: an evaluation study of Iranian diabetes screening program. *Diabetology & Metabolic Syndrome*, *13*, 1-9.

Marshall, E. S., & Broome, M. E. (2017). Transformational leadership in nursing: From expert clinician to influential leader (2 ed.). New York, NY: Springer Publishing Company.

Mohd Fauzi, N. F., Wafa, S. W., Mohd Ibrahim, A., Bhaskar Raj, N., & Nurulhuda, M. H. (2022). Translation and Validation of American Diabetes Association Diabetes Risk Test: The Malay Version. The Malaysian journal of medical sciences : MJMS, 29(1), 113–125.

Risk test. Risk Test | ADA. (n.d.). Retrieved April 8, 2023, from https://diabetes.org/diabetes/risk-test

Tentolouris, N., Lathouris, P., Lontou, S., Tzemos, K., & Maynard, J. (2013). Screening for HbA1c-defined prediabetes and diabetes in an at-risk Greek population: performance comparison of random capillary glucose, the ADA diabetes risk test and skin fluorescence spectroscopy. *Diabetes research and clinical practice*, *100*(1), 39-45.

Trikkalinou, A., Papazafiropoulou, A. K., & Melidonis, A. (2017). Type 2 diabetes and quality of life. *World journal of diabetes*, *8*(4), 120.

Urrutia, I., Martín-Nieto, A., Martínez, R., Casanovas-Marsal, J. O., Aguayo, A., Del Olmo, J., ... & Gaztambide, S. (2021). Incidence of diabetes mellitus and associated risk factors in the adult population of the Basque country, Spain. *Scientific Reports*, *11*(1), 1-8.

Uusitupa, M., Khan, T. A., Viguiliouk, E., Kahleova, H., Rivellese, A. A., Hermansen, K., ... & Sievenpiper, J. L. (2019). Prevention of type 2 diabetes by lifestyle changes: a systematic review and meta-analysis. *Nutrients*, *11*(11), 2611.

Vera-Ponce, V. J., Osada Liy, J. E., & Valladares-Garrido, M. J. (2021). Validity of the American Diabetes association Diabetes risk test as screening for Prediabetes in a sample of peruvian workers. *Revista de la Facultad de Medicina Humana*, *21*(3), 14.

APPENDIX A

Prediabetes Risk Test

NATIONAL DIABETES PREVENTION PROGRAM

1. How old are you?

Write your score in the boxes below

Younger than 40 years (0 points)
40–49 years (1 point)
50–59 years (2 points)
60 years or older (3 points)

2. Are you a man or a woman?

Man (1 point) Woman (0 points)

3. If you are a woman, have you ever been diagnosed with gestational diabetes?

Yes (1 point) No (0 points)

4. Do you have a mother, father, sister, or brother with diabetes?

Yes (1 point) No (0 points)

5. Have you ever been diagnosed with high blood pressure?

Yes (1 point) No (0 points)

6. Are you physically active?

Yes (0 points) No (1 point)

7. What is your weight category?

(See chart at right)

Total score:

Height	Weight (lbs.)		
4'10"	119-142	143-190	191+
4'11"	124-147	148-197	198+
5'0"	128-152	153-203	204+
5'1"	132-157	158-210	211+
5'2"	136-163	164-217	218+
5'3"	141-168	169-224	225+
5'4"	145-173	174-231	232+
5'5"	150-179	180-239	240+
5'6"	155-185	186-246	247+
5'7"	159-190	191-254	255+
5'8"	164-196	197-261	262+
5'9"	169-202	203-269	270+
5'10"	174-208	209-277	278+
5'11"	179-214	215-285	286+
6'0"	184-220	221-293	294+
6'1"	189-226	227-301	302+
6'2"	194-232	233-310	311+
6'3"	200-239	240-318	319+
6'4"	205-245	246-327	328+
	1 Point	2 Points	3 Points
	You weigh less than the 1 Point column (0 points)		

Adapted from Bang et al., Ann Intern Med 151:775-783, 2009. Original algorithm was validated without gestational diabetes as part of the model.

If you scored 5 or higher

You are at increased risk for having prediabetes and are at high risk for type 2 diabetes. However, only your doctor can tell for sure if you have type 2 diabetes or prediabetes, a condition in which blood sugar levels are higher than normal but not high enough yet to be diagnosed as type 2 diabetes. Talk to your doctor to see if additional testing is needed.

If you are African American, Hispanic/Latino American, American Indian/Alaska Native, Asian American, or Pacific Islander, you are at higher risk for prediabetes and type 2 diabetes. Also, if you are Asian American, you are at increased risk for type 2 diabetes at a lower weight (about 15 pounds lower than weights in the 1 Point column). Talk to your doctor to see if you should have your blood sugar tested.

You can reduce your risk for type 2 diabetes

Find out how you can reverse prediabetes and prevent or delay type 2 diabetes through a CDC-recognized lifestyle change program at https://www.cdc.gov/diabetes/prevention/lifestyle-program.

Risk Test provided by the American Diabetes Association and the Centers for Disease Control and Prevention.

American Diabetes Association. CDC Centers for Disease Control and Prevention

CS300699-A