

**AN EXPLORATORY DESCRIPTION OF LIFESTYLE BEHAVIORS AND PHYSIOLOGIC
OUTCOMES IN TURKISH WOMEN
WITH TYPE 2 DIABETES**

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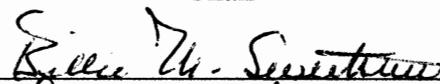
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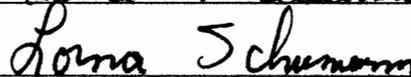
To the Faculty of Washington State University:

The members of the Committee appointed to examine the dissertation/thesis of
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Chair





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Abstract

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Type 2 diabetes is a growing concern worldwide. The study purpose was to describe the lifestyle behaviors of Turkish women with type 2 diabetes. Turkish women with type 2 diabetes completed a survey describing their lifestyle behaviors. Over half of the women had reportedly been given a diagnosis of hyperlipidemia and hypertension, increasing their risk for cardiovascular complications. Blood glucose self-monitoring was done infrequently by the majority of women in the study. Results showed deficits in the amount and quality of physical activity as well as foot care. Favorable results were reported by the Turkish women regarding dietary habits with the majority eating fruits, vegetables, and salads daily. In addition, all of the women denied drinking alcohol and only one reported smoking. Improving care for Turkish women with type 2 diabetes by implementing aspects of the Chronic Care Model is explored.

Key Words: Diabetes (type 2), heart disease, hypertension, hyperlipidemia, obesity

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Introduction

Type 2 diabetes is a growing problem worldwide. An increased incidence of the condition is “due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity.”¹ Diabetes health problems are manifold because diabetes greatly increases the risk for cardiovascular disease and other comorbidities. Type 2 diabetes places a significant burden on the healthcare system and the quality of the lives it influences. Individuals often do not know they have diabetes until complications are already present.

Health care providers have the capacity to significantly impact this problem by facilitating lifestyle behaviors conducive to preventing and managing diabetes. The Diabetes Prevention Program Research Group study found “that lifestyle interventions delivered over 2.8 years reduced the incidence of diabetes by 58%.”² Further, for those with diabetes, lifestyle changes contribute significantly to improved control, a delay or reduction in comorbid complications, and improved quality of life.

Diabetes has been studied extensively and continues to gain much attention in research efforts because it affects multiple aspects of the person’s health including renal, cardiovascular and neurological function. Lifestyle changes are the mainstay for diabetes management and preventing diabetes-related complications.³ The study purpose was to describe the lifestyle behaviors reported by Turkish women with type 2 diabetes.

Review of the Literature

The historical progression of diabetes research has shifted from a description of type 2 diabetes to the prevention of type 2 diabetes and the global effect of diabetes. Despite the realization that preventing type 2 diabetes is ideal, over 135 million people worldwide already have diabetes.⁴ In Turkey, an estimated 2.89 million (11% of the population over 35 years of

age) people have diabetes.⁵ The prevalence of diabetes (type 1 and type 2) for adults in the US is about 8%.⁵

Type 2 Diabetes Prevalence in Turkey

In a study of individuals selected from five health districts in the northeastern part of Turkey between the years 1998 and 1999, the prevalence of diabetes in women was 6.7%, and 5.4% among men.⁶ Random cluster sampling was used to select the participants. The researchers reported a positive correlation between the degree of obesity and the prevalence of diabetes in a Turkish population from Trabzon City.

The prevalence of diabetes in Turkey was investigated to evaluate regional variations and to describe relationships between glucose intolerance and lifestyle and physical risk factors among a population of Turkish residents over twenty years of age.⁷ The results of the Turkish Diabetes Epidemiology Study (TURDEP) revealed that awareness regarding diabetes is poor in Turkey. The frequency of diabetes in Turkey was found to be moderately high at 7.2% of those aged 20 or older. Prevalence of diabetes in women was found to be 8% as compared to 6.2% in men. Investigators postulated that Turkish women's lower rate of employment outside the home may be a contributing factor to their higher frequency of obesity and glucose intolerance. Usual physical activity consists of housework and traditionally, women do not participate in sports or formal physical activity. Turkey's southern region had the highest rates of diabetes. The lowest prevalence was in the eastern part of Turkey, where people work more commonly in agriculture and where the public transportation system is less developed. More years of formal education was protective for diabetes.

Research to investigate the prevalence of type 2 diabetes in Adana, a southern province of Turkey, included 1637 randomly selected adults aged 20-79 years of age.⁸ Based on the findings, the investigators concluded that the prevalence of diabetes in that particular region was higher than expected at 11.6% (crude prevalence was 12.9% for men and 10.9% for women). Obesity and lack of physical activity were highly correlated to diabetes.

The prevalence of metabolic syndrome was investigated in seven regions of Turkey using 15,468 Caucasian participants over age thirty.⁹ The study conducted by the Health Ministry of Turkey from December 2000 to December 2002 showed a high prevalence of obesity and metabolic syndrome in women (prevalence of metabolic syndrome was 10.09% in men and 27.33% in women). Metabolic syndrome statistics for US adults were 24% for men and 23.4% for women according to The National Health and Nutrition Examination Survey. Even though obesity prevalence was high (35.08%) in Turkey (21.16% in men and 41.32% in women), hypertension (13.66%) and hypercholesterolemia (29.89% in men and 28.35% in women) were relatively low. Lower educational levels were associated with an increased prevalence of metabolic syndrome, diabetes, obesity, and hypertension.

Despite research documenting the increasing prevalence of diabetes in Turkey, particularly among women, research related to lifestyle and diabetes self-management in Turkey is virtually non-existent. It is essential for people with diabetes to be educated on the lifestyle measures that are important for diabetes management. In addition to good glucose control that includes self-monitoring, lipid and blood pressure control are necessary for people with diabetes.¹⁰ While medications can improve glucose, blood pressure, and lipid levels, lifestyle behaviors such as high nutrient dense foods eaten in appropriate portions, daily or near-daily

physical activity, and smoking cessation are important for optimal health outcomes .¹¹ There is a knowledge gap about the lifestyle and self- management behaviors used by Turkish women with diabetes. The purpose of this exploratory pilot study was to describe the lifestyle behaviors of Turkish women with type 2 diabetes.

Conceptual Framework

The essential element of successful chronic illness care is a productive interaction between the patient and the health care team utilizing evidence based practices. A prepared knowledgeable health care team is essential to treating and supporting a person with a chronic disease. The Chronic Care Model consists of six components which work together in the successful management of chronic disease. These components are: community resources and policies, health system, self management support, delivery system design, decision support, and clinical information systems.¹² Continuous and holistic support is necessary to optimally manage chronic health care problems.

To be successful, people with type 2 diabetes must be highly motivated and take an active role in their health care and work in collaboration with the physician to manage diabetes. Diabetes affects all aspects of a person's life and takes an extreme amount of energy and knowledge to manage successfully. Diabetes requires an ongoing commitment and surveillance from the person who is diagnosed with the disease, as well as the health care provider. A multitude of systems to improve patient care for people with diabetes and, in turn, decrease diabetic complications can be implemented such as: tracking core components of care, integrated guidelines, telephone follow up, substantial support for self management activities.¹³

Developing and consistently using a good tracking system to monitor patients with diabetes is an excellent way to ensure that the most important aspects of care are being managed. Ongoing support is needed for the patient so that they have the tools to adequately manage diabetes.

Methods

Study Design/Procedures

A descriptive study design was used with a convenience sample of 27 Turkish women diagnosed with type 2 diabetes. The women resided in Istanbul, Turkey and were recruited when they sought care at an endocrinology clinic in Istanbul, Turkey. In Turkey, appointment times are not available and people seeking care often wait hours to be seen by a physician. Women known to have type 2 diabetes were informed of the opportunity to participate in the study when they checked in at the clinic. If interested, written informed consent, in Turkish, was obtained, and women were given a survey related to lifestyle behaviors to complete as they awaited their appointments.

Human Subjects Protection Plan

The surveys were collected in accordance with the human subject protection plan and human subject's approval was obtained from the ethics board in Turkey, as well as from an IRB in the United States. Following written informed consent, the participants were assigned study identification numbers. All data collection forms were identified using the study identification number. Participant risks were minimal, primarily consisting of the time and inconvenience of completing the survey. Respondents were instructed to skip any questions that made them uncomfortable, and that participation or non-participation would not impact their current or future health care services. There were no direct benefits to the participants who completed the

questionnaires. The knowledge gained from the study may identify information to enhance the management and treatment for Turkish women with type 2 diabetes.

Measurement Tools

Forty-one questions adapted from the 2002 Behavioral Risk Factor Surveillance System (BRFSS), United States telephone health survey were included in the questionnaire. The BRFSS was established in 1984 by the Centers for Disease Control and it is the largest telephone health survey in the world. Data for the BRFSS is collected monthly from all fifty states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. A Turkish version of the BRFSS was used for this study. The questions related to health habits/lifestyle behaviors and reported knowledge of their hemoglobin A1C, lipids and blood pressure. Questions about physical activity, diet, tobacco use, alcohol consumption, medications, diabetes, hypertension, cholesterol awareness, cardiovascular disease, and weight control were included.

Data Analysis Procedures and Tests

Data was analyzed using SPSS software, version 14.0. Data was cleaned and screened for errors and to establish variable distribution (normal or non-normal) using frequencies, means, standard deviations, scatter plots and histograms. Descriptive statistics were used to describe participant characteristics and their reported lifestyle behaviors.

Results

Twenty-seven questionnaires were analyzed from Turkish women ranging in age from thirty years of age to seventy-three years of age. Most of the women (85.2%) reported that they were married and did not work outside the home. Reported duration of diabetes ranged from 6 months to 23 years. Over 51% of the women reported having a diagnosis of high blood pressure and

60% of the women reported having a diagnosis of hyperlipidemia. Two of the participants did not answer the question regarding hyperlipidemia.

Eleven women completed the question that asked for the values of their lipids. For the 11 participants, total cholesterol ranged from 141 to 270 with a mean of 210.36 (SD=10.70). The mean HDL was 54.67 (range: 31-107, SD=11.31) and the mean LDL was 120.8 (range: 66-183).

Frequency of self-blood glucose monitoring was low for the majority of the respondents. Only 11% (n=3) of the women reported checking their blood sugar more than one time a day. Approximately one quarter (26%, n=7) reported never checking their blood sugar while nearly one quarter (22%, n=6) reported checking their blood sugar only several times per month.

The mean hemoglobin A1C was 7.45 (SD=0.429). However, only 59% of the women reported having had their hemoglobin A1C checked in the past twelve months. Nearly 1/3 (30%) of the Turkish women reported not knowing how many times in the past twelve months their hemoglobin A1C had been checked, 7% reported their hemoglobin A1C had not been checked at all within the past twelve months, and 4% reported having never heard of hemoglobin A1C.

Prior cardiovascular events were minimal. Only one participant reported having had a myocardial infarction. She was forty-nine years of age at the time of the event. Another participant reported having had a stroke at age fifty-eight.

Regarding foot care, 22.2% of the Turkish women reported never checking their feet for sores or irritations. The remaining women reported checking their feet several times a week (7.4%), once a day (44.4%), or more than once a day (22.2%) with the exception of one participant who answered "don't know/not sure". Eighty-one percent of the Turkish women reported that a health care provider had never checked their feet in the past twelve months, while

37% reported having a history of sores or irritations on their feet that took more than four weeks to heal.

Low physical activity levels were reported by the participants. On average, the women reported participating in at least ten minutes of moderate physical activity a mean of 5.32 days and participating in vigorous activity at least ten minutes at a time a mean of 3.00 days. The majority (93%) of the women reported never participating in at least ten minutes of vigorous physical activity.

Reported dietary habits were notable, because all participants reported eating fruits every day. Nearly all participants (93%) reported eating salad every day and 85% reported eating vegetables every day. None of the participants reported drinking alcohol. Only one participant (4%) reported smoking at least one hundred cigarettes in her life. However, related to the question regarding rules about smoking inside the home, 59% of the women reported that smoking is allowed in some places or at some times and only 37% reported that smoking was not allowed anywhere inside the home.

Discussion

Turkish women must be informed about the disease process and potential complications of diabetes. The Chronic Care Model provides a framework to enhance diabetes management. Using this framework, the dynamics of outpatient care shift from an acute care perspective to a more holistic, chronic care environment.

Sixty percent of the Turkish women reported having a diagnosis of hyperlipidemia. Patients with type 2 diabetes have a higher prevalence of hyperlipidemia increasing their risk for cardiovascular complications.¹⁰ For the 11 participants who completed the lipid question, total

cholesterol ranged from 141 to 270 with a mean of 210.36 (SD=10.70). The 2007 Standard of Medical Care in Diabetes and the International Diabetes Federations recommend testing lipids along with other cardiovascular risk factors at least annually.^{10,14} Lipid target levels for people with diabetes are: total cholesterol <200 mg/dL, LDL <100 mg/dL, HDL >40 mg/dL, triglycerides <150 mg/dL.¹⁰

Blood glucose self monitoring was done infrequently by the majority of women in the study. Blood sugar monitoring and teaching women ways to maintain acceptable blood glucose levels throughout the day are areas for improvement. Adequate control of blood sugar, including avoiding post-prandial spikes, is associated with decreased risk of complications.¹⁵ Similarly, participants reported a lack of knowledge about their hemoglobin A1C results. Nearly one third (30%) lacked knowledge about the number of times their hemoglobin A1C had been checked in the past year, 7% reported that they had not had their hemoglobin A1C checked at all within the past year, and 4% reported that they had never heard of hemoglobin A1C. The average A1C was 7.45%, significantly higher than standard clinical goals which range from 6.1% to 7% (American Association of Diabetes Educators, 2007; American Association of Clinical Endocrinologists, 2002; European Guidelines on Cardiovascular Disease Prevention in Clinical Practice, 2003). Hemoglobin A1C levels should be monitored every six months if goals are being met or every three months if goals are not being met. Monitoring hemoglobin A1C levels and blood sugar are important aspects of diabetes management. Enhancing these vital areas of diabetes care has the potential to significantly improve overall care outcomes. Improving in even one area of the Chronic Care Model enhances patient outcomes.¹³

The majority of the Turkish women (81%) reported that a health care provider had never checked their feet within the past twelve months, yet 37% reported a history of having a sore or

irritation on their feet that took more than four weeks to heal. Most of the participants reported self-assessing their own feet regularly. Frequent self foot care may stem from a cultural influence. Foot care education about preventing, not merely detecting foot problems, may be warranted. In addition, health system changes encouraging providers to routinely evaluate patients' feet are indicated. Routine assessment and early intervention significantly reduce foot problems and amputations.¹⁶

Turkish women reported participating in significantly lower than recommended amounts and types of physical activity. The participants reported at least ten minutes of moderate physical activity at a time an average of 5.32 days and at least ten minutes of vigorous activity only an average of 3.00 days. Regarding vigorous physical activity, 93% of the participants reported never engaging in this type of physical activity for at least ten minutes at a time. The 2007 Standards of Medical Care in Diabetes recommend at least 150 minutes a week of moderate intensity aerobic physical activity and/or at least 90 minutes a week of vigorous aerobic exercise for all people with diabetes.¹⁰ The standards also recommend participating in physical activity at least three days a week with no more than two days in a row without physical activity.¹⁰ Resistance exercise three times per week is also recommended, unless individually contraindicated for people with diabetes.¹⁰

The Turkish women reported favorable dietary habits with the majority eating fruits, vegetables, and salads daily. In addition, all of the women denied drinking alcohol and only one reported smoking. However, related to the question regarding rules about smoking inside the home, 59% of the women reported that smoking is allowed in some places or at some times and only 37% reported that smoking was not allowed anywhere inside the home. So, the women may be exposed to second hand smoke.

Diabetes in Turkey is more prevalent in women than men at 8% and 6.2%, respectively. Turkish women tend to have a higher frequency of obesity and a low amount of physical activity. Turkish women generally do not work outside the home and most of their physical activity involves housework. The highest numbers of diabetes were found in the southern region of Turkey at 9% and the eastern part of Turkey had the lowest prevalence of diabetes.

Limitations

The limitations of this research include the small convenience sample of women who were receiving care at an endocrinology clinic. These women may differ significantly from the general population of women in Turkey with diabetes. No generalizations to other populations can be assumed. Data were collected in Turkey and interpreted in the United States. Thus, there were cross-cultural limitations, such as the fact that women reported only their systolic blood pressure. The self report format of the collected data is also a limitation, especially because questions were developed in the United States, some of which may be interpreted differently by Turkish women. Lifestyle behaviors contributing to or protective for type 2 diabetes were illuminated. The information derived from this study may help health care providers tailor health care for Turkish women with type 2 diabetes.

Significance for Nursing

Diabetes is a global health problem. Further knowledge regarding lifestyle behaviors of people around the world is necessary to improve management and outcomes. Health care providers can significantly contribute to teaching and motivating people with diabetes to improve lifestyle behaviors and self-management skills. Culturally appropriate care is essential and descriptive research about current knowledge, behaviors and preferences is an initial step toward enhancing care and implementing health system changes.

Further research regarding the lifestyle behaviors contributing to diabetes management among varying ethnic groups is crucial to enhance the knowledge base regarding type 2 diabetes. Consequently, health care providers and patients can work together to tailor lifestyle behaviors to promote patients' health and curtail the devastating effects of type 2 diabetes. The Chronic Care Model can be used to guide improved self management and care systems for Turkish women. Society must work together to halt the devastating effects that type 2 diabetes has upon so many unfortunate people.

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