

Unrealistic Optimism, Sex, and Risk Perception of Type 2 Diabetes Onset: Implications for Education Programs

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■ ABSTRACT

This study examined links among unrealistic optimism, sex, and risk perception of type 2 diabetes onset in college students. Participants included 660 college students who consented to complete a questionnaire. The results showed significant differences between students who perceived that they were at risk for type 2 diabetes onset and those who thought their peers were the ones at risk. A higher prevalence of participants thought their peers were the ones at risk for type 2 diabetes. Women were more likely than men to report a higher risk perception, indicating that their peers were at lower risk for diabetes onset.

Historically, type 2 diabetes was usually diagnosed in individuals ≥ 40 years of age. However, as reported by the SEARCH for Diabetes in Youth Study (1) between 2001 and 2005, the prevalence of type 2 diabetes among younger age-groups (< 20 years of age) more than doubled. There has also been an increase in the prevalence of type 2 diabetes among people in their 30s (2–4). In 2010, the Centers for Disease Control and Prevention reported that 25.6 million people ≥ 20 years of age and 215,000 individuals < 20 years of age are affected by diabetes (5). Diabetes is now the leading cause of chronic diseases of childhood and adolescence in the United States (1,6). Because type 2 diabetes affects children and adolescents, college students are not exempt from developing diabetes. Therefore, there is a need to assess college students' perception of their risk for developing type 2 diabetes and to tailor appropriate messages to meet their needs.

Diabetes Risk Factors and College Students

Young adults tend to gain weight when they attend college (7–9), and

physical activity tends to decline in this population. A survey of 400 college students revealed that 46.7% of the sample did not engage in vigorous physical activity, and 16.7% were physically inactive (10). Based on research findings linking weight gain and reduced levels of physical activity to increased risk of type 2 diabetes, it is advisable for this population to learn about preventing or delaying the onset of this condition (11).

Type 2 diabetes diagnosed at younger ages could place an additional economic burden on society because of the health complications commonly associated with this disease and associated premature mortality, as well as increased health care costs (12). Unfortunately, young adults may not be aware of the increased risk for type 2 diabetes that results from their lifestyle (e.g., unhealthy food and beverage choices and reduced levels of physical activity). Therefore, targeted diabetes education programs are needed to give these individuals an opportunity to learn about how they can modify their lifestyle while there is still time to prevent or delay the onset of dia-

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betes at an early age. However, before attempting to tailor type 2 diabetes awareness programs for this population, it is necessary to identify their perception of their risks for developing diabetes.

Risk Perception of Type 2 Diabetes

Individuals' risk perception is based on their intuitive judgments when evaluating potential hazards (13). Risk perception for becoming ill is crucial to explaining why people engage in health-related behaviors (14). A few studies of risk perception and diabetes have been conducted among college students. One survey was designed to determine college students' perception of their risk for developing diabetes in the next 10 years (15). The results showed that participants who identified themselves as being part of a racial or ethnic group other than non-Hispanic white and who had family members with diabetes perceived an absolute 10-year risk of diabetes onset (15). Another study found that participants rated their risk for diabetes onset lower than their risk for heart disease (16). A third study focusing on perceived susceptibility among college students found that 32% of a sample of 707 students perceived themselves to be susceptible to developing diabetes (17). It has been proposed that individuals must perceive that they are at high risk of developing a disease to consider modifying their health behaviors to prevent its onset (18).

Sex and Type 2 Diabetes Risk Perception: Gaps in Research

There is a dearth of research to identify sex-related differences in risk perception of type 2 diabetes onset among college students. Studying whether male and female students perceive type 2 diabetes differently is important because it has been reported that women who have family members or friends with diabetes have a greater perceived risk for the disease, whereas only a family history of diabetes contributes to greater per-

ceived risk for men (19). If differences in risk perception do exist between male and female college students, these differences must be identified and better understood to develop sex-specific interventions to influence men's and women's risk perception (20) of type 2 diabetes onset.

Unrealistic Optimism

It has been proposed that individuals tend to be unrealistically optimistic about their likelihood of experiencing positive life events and of not experiencing negative life events in comparison to their peers (21,22). Convincing people to adopt prudent health behaviors may be more difficult if they believe they are either not susceptible to a disease or less susceptible than others (23). Individuals in general believe that they are less likely than other people to experience negative health outcomes (24). Raats and Sparks (25) found that there is a tendency for individuals to indicate that other people have a higher risk than themselves for experiencing a negative life event. This tendency shows an optimistic bias. Identifying such optimistic biases in personal risk perceptions is necessary because they may seriously hinder efforts to promote risk-reducing behaviors (23).

The aim of this exploratory study was to examine the relationship between unrealistic optimism, sex, and risk perception of type 2 diabetes onset in college students. To identify whether there was unrealistic optimism in the sample, it was hypothesized that more college students think their peers are at risk for type 2 diabetes onset than believe that they are themselves at risk. The first research question explored whether there is a difference between the sexes in terms of type 2 diabetes risk perception. A second research question sought to identify whether there is a difference in risk perception of developing diabetes in their lifetime between students who think they are at risk for type 2 diabetes

onset and those to think other students are the ones at risk.

Study Methods

This cross-sectional study was conducted at a university located in Walker County, Tex. Faculty representing five colleges on the campus were contacted via e-mail before the start of the fall semester and asked to participate in the study. Fifty professors agreed to have researchers recruit students who were willing to participate voluntarily. A total of 660 students agreed to take part in the study. Researchers instructed the participating students to read and sign a consent form and to complete a 6-page, self-administered questionnaire that took 15 minutes to complete. The questionnaire included 27 questions and was distributed at the beginning of a class session. Completed questionnaires were placed in an envelope or box. The university's human subjects institution review board approved this project. Data analysis was conducted using IBM Statistics SPSS 20.0 software (IBM, Armonk, N.Y.).

Study Measures

Unrealistic Optimism

As operationalized by Weinstein (22,23), participants were asked to answer the following question: Compared to college students of your age, who do you think has a higher chance of developing type 2 diabetes in the future? One answer choice was: "I think I have a higher chance of developing type 2 diabetes than other students have." The other choice was: "I think other students have a higher chance of developing type 2 diabetes."

Risk Perception of Type 2 Diabetes Onset

An index was created based on the work of Covello and Peters (26). The following items were used to create the index:

- Based on your lifestyle, do you think you are at risk of developing type 2 diabetes in your lifetime? Possible answers were: "I am at

great risk of developing type 2 diabetes,” “I am at some risk of developing type 2 diabetes,” “I am not sure,” and “I am at no risk.”

- Based on your family background, do you think you are at risk of developing type 2 diabetes in your lifetime? Possible answers were: “I am at great risk of developing type 2 diabetes,” “I am at some risk of developing type 2 diabetes,” and “I am at no risk of developing type 2 diabetes.”
- How concerned are you about developing type 2 diabetes in your lifetime? Possible answers were: “Very concerned,” “Somewhat concerned,” and “Not concerned at all.”

Cronbach’s alpha for the index was 0.801 ($n = 660$).

Data were collected on participants’ sex, ethnicity, and age. Sex was defined as male or female. Ethnicity was defined as Caucasian, African American, Hispanic, Asian or South Pacific Islander, Middle Eastern, American Indian/Alaskan Native, or other. Participants were asked to provide their age, height, weight, and information about their family history of diabetes. Participants’ BMI was calculated, and weight classifications were developed from height/weight indexes.

Study Results

A total of 660 students participated in the study. Students who indicated they had diabetes were excluded from the dataset ($n = 8$). Demographic characteristics of all respondents are shown in Table 1. The mean BMI of participants was 24.77 ± 5.96 kg/m². More than half (55.9%) of the participants had a body weight within the normal range (18.5–24.9 kg/m²), whereas 4.5% were classified as underweight (<18.5 kg/m²), 24.8% as overweight (25.0–29.9 kg/m²), 9.2% as obese class 1 (30–34.9 kg/m²), 2.6% as obese class 2 (35–39.9 kg/m²), and 3.0% as in an extreme weight category (>40 kg/m²) (27). Less than one-fourth (21.5%) of the

TABLE 1. Demographic Characteristics of Participants

Characteristics	<i>n</i>	Frequency (%)
Sex ($n = 652$)		
Female	411	63.0
Male	241	37.0
Ethnicity ($n = 652$)		
Caucasian	443	67.9
African American	104	16.0
Hispanic	75	11.5
Asian or South Pacific Islander	4	0.6
Middle Eastern	1	0.2
American Indian/Alaskan Native	5	0.8
Other	20	3.0
Mean age (years)	20.86 \pm 3.92	

participants reported having a blood relative with diabetes in their nuclear family, whereas more than half (57.9%) indicated that they had a blood relative with diabetes in their extended family. Eleven of the participants had been diagnosed with diabetes or prediabetes (type 1 diabetes $n = 1$, type 2 diabetes $n = 2$, gestational diabetes $n = 5$, and prediabetes $n = 3$).

A χ^2 test was conducted to test the first hypothesis that more college students think their peers are at risk for type 2 diabetes onset than believe that they are themselves at risk. The results showed that the majority of students (68%) thought their peers were at risk for type 2 diabetes. Significantly more participants believed that their peers were at risk than believed they were themselves at risk (23%) for the disease ($\chi^2 = 176.076$, $df = 1$, $P < 0.001$). Consequently, this hypothesis was accepted.

The first research question sought to determine whether there is a sex-related difference in type 2 diabetes risk perception. Participants ($n = 358$) who indicated that they did not know their risk for type 2 diabetes onset were omitted from the analyses. The results showed that 358 participants were not sure about their risk for diabetes onset. Of the

excluded students, 64% were female, and 36% were male ($\chi^2 = 23.520$, $df = 1$, $P = 0.000$). A total of 105 students (35.0%) were classified as overweight, obese class 1, obese class 2, or extremely obese. The majority of the excluded participants thought their peers were the ones at risk for type 2 diabetes onset (“Others are at risk” 85.8% vs. “I am at risk” 14.2% [$\chi^2 = 151.838$, $df = 1$, $P = 0.000$]). More than half (69%) of the excluded students were Caucasian, 16.3% were African American, 10% were Hispanic, 0.7% were Asian or South Pacific Islander, 0.7% were American Indian/Alaska Native, and 3.3% were of other ethnic or racial backgrounds ($\chi^2 = 625.160$, $df = 5$, $P = 0.000$).

An analysis of variance (ANOVA) was conducted with the remaining 302 participants to test for sex-related differences. The results showed a statistically significant difference between the means of the sexes ($F = 9.472$, $df = 1$, $P = 0.002$).

The second research question sought to identify differences in risk perceptions of type 2 diabetes onset between students who thought they were personally at risk for type 2 diabetes and those who thought other students were at risk. Students who had a lower risk perception ($n = 241$) exercised an average of 3.68 days/week. Within this group, 15.8%

reported having no daily servings of fruit, 47.9% reported having an average of 1 daily serving, 27.1% reported having 2 servings, 6.3% reported having 3 servings, and 2.9% reported having ≥ 4 daily servings. In addition, 13% of the participants who had low risk perception reported having no daily servings of vegetables, 32.6% reported having 1 daily serving, 30.5% reported having 2 daily servings, 18% reported having 3 daily servings, and 5.9% reported having ≥ 4 daily vegetable servings. Participants who reported having a blood relative with diabetes in their nuclear family had a moderately high risk perception (mean = 6.58, $t = 10.740$, $df = 306$, $P = 0.000$). In this group, 65 participants indicated that they thought they were at risk for type 2 diabetes, and 69 indicated that their peers were at risk for diabetes onset. African-American (mean = 5.79) and Hispanic (mean = 5.87) participants reported a moderate risk perception of type 2 diabetes onset. Caucasian participants reported a lower risk perception average (mean = 4.88).

An ANOVA was conducted to answer the second research question. The results showed a significant difference between the groups ("I am at risk" mean = 6.66 ± 1.05 vs. "Other students are at risk" mean = 4.33 ± 1.37 ; $F = 232.854$, $df = 1$, $P = 0.000$).

Discussion

This exploratory study investigated associations among unrealistic optimism, sex, and risk perception of type 2 diabetes onset in college students. The results showing a greater number of students who thought their peers have a higher risk of type 2 diabetes in their lifetime indicated the presence of unrealistic optimism in the sample.

A total of 358 participants (66% of the sample) reported not being sure of their risk for developing type 2 diabetes, which is an alarming fact and points to the need for more education. The majority of these participants

(64%) were female, and 35% of participants who did not know whether they are at risk for type 2 diabetes were classified as overweight, obese class 1, obese class 2, or extremely obese. The majority of these participants who did not know their own risk (85.8%) thought their peers were at risk for type 2 diabetes.

Participants who thought they are at risk for type 2 diabetes had a higher type 2 diabetes onset risk perception than those who thought their peers were the ones at risk. Although these findings are consistent with previous research on unrealistic optimism (22–25), they support the need for differently tailored type 2 diabetes education programs and messages that resonate with college students who have different risk perceptions. This research suggests that individuals who think their peers are susceptible to type 2 diabetes but that they themselves are not may be more difficult to convince and may require more targeted communication efforts.

It has been stated that males and females in general have different levels of risk perception about diabetes onset (19). Hence, it was important to investigate whether male and female college students perceive type 2 diabetes differently. Despite the fact that the study sample included more women than men, the results showed that women had a higher level of risk perception than did men. This finding is consistent with previous work indicating that, under certain circumstances, women express greater concern than men about risks for disease onset (28).

The results of this study also showed that most of the participants were not sure of their risks for diabetes. Given that diabetes prevalence in 2011 was higher among men (5) and that this study showed that men had a lower risk perception than women, it is recommended that sex-specific

education programs be developed and implemented for college students.

This study also suggests that, when designing education programs, it is important to identify whether individuals perceive themselves to be at risk for type 2 diabetes. It is also important to address through targeted programs the subset of individuals who do not know their risk. Diabetes prevention messages may need to be tailored specifically for individuals who have no, low, or high levels of risk perception. Based on this study, it is advisable to also assess education program participants' actual risk (i.e., BMI, genetics, and family history) and compare it to their risk perception.

Further research is needed to identify which types of education programs and messages are most effective for reducing type 2 diabetes among college students and to educate this population (29). Given that individuals have different risk perceptions of type 2 diabetes, those planning education programs or interventions may consider employing the theory of planned behavior (30) to try to persuade individuals to modify health behaviors that can help to prevent or delay type 2 diabetes. This theory calls for investigating individuals' attitudes, and beliefs, as well as the extent to which they perceive control in performing a behavior and their intention to execute that behavior.

Study Limitations

There are limitations to this study that should be considered carefully. First, the study did not account for cultural differences in identifying risk perception among different racial/ethnic groups. Based on individuals' cultural background, it is possible that perceptions of risk for diabetes onset may differ. Second, because this was a cross-sectional study conducted at one university, it is necessary to investigate whether students in different geographical regions or at different schools have different risk

perceptions of type 2 diabetes. Third, actual risk (i.e., BMI, genetics, physical activity, and family history) was not included in this study. Fourth, not all participants responded to all questions.

The findings from this study set the stage for a deeper understanding of how risk perception can affect lifestyle change among college-aged individuals. This study also provides a reason to intervene to educate college-aged students who are not familiar with their own risk or with the contributing factors to risk for developing type 2 diabetes. Obesity plays a significant role in the development of type 2 diabetes and other health conditions. The importance of changing modifiable lifestyle behaviors (e.g., adopting healthful eating patterns and increasing physical exercise) has been noted for prevention of diabetes and related diseases (27). Future research should focus on lifestyle-based risk factors in addition to risk perceptions and sex-specific influences in this population.

Duality of Interest

No potential conflicts of interest relevant to this article were reported.

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