Psychosocial and Health Behavior Outcomes of Young Adults with Asthma or Diabetes

Jerica M. Berge1,*, Katherine W. Bauer2, Marla E. Eisenberg3, Kara Denny4 and Dianne Neumark-Sztainer2

1Department of Family Medicine and Community Health, University of Minnesota, USA
2Division of Epidemiology and Community Health, University of Minnesota, USA
3Division of Adolescent Health and Medicine, University of Minnesota, USA
4Division of Pediatrics, University of Minnesota, USA

Abstract

Purpose: Previous research has shown a relationship between childhood/adolescent chronic conditions and negative health behaviors, psychological outcomes and social outcomes. Less is known about whether these negative outcomes are experienced by young adults with chronic health conditions. The purpose of this paper is to investigate how young adults’ BMI, health behaviors and psychological and social outcomes differ depending on whether they have diabetes, asthma, or neither of these chronic conditions.

Methods: Data were drawn from the third wave of Project EAT-III: Eating and Activity in Young Adults, a population-based study of 2287 young adults (mean age = 25.3; range 19.8 – 31.2). General linear models were used to test differences in BMI, health behaviors (e.g., fast food intake) and psychosocial outcomes (e.g. depressive symptoms) by young adults’ chronic disease status.

Results: Young adults with diabetes had higher BMIs, engaged in less physical activity and more unhealthy weight control behaviors and binge eating, had lower self-esteem and lower body satisfaction and experienced more depressive symptoms and appearance-based teasing compared to young adults with asthma or no chronic conditions, after adjusting for age, race/ethnicity, socio-economic status (SES) and, when relevant, for BMI. There were no significant differences between young adults with asthma and young adults with any chronic condition on all of the psychosocial and health behavior outcomes.

Conclusions: Young adults with diabetes reported higher prevalence of negative health behaviors and psychosocial outcomes. Providers may find it useful to assess for negative health behaviors and psychosocial variables with young adults with diabetes in order to improve treatment and quality of life for these individuals.

Keywords: Young adults; Chronic condition; Health behavior; Psychological; Social

Introduction

There is a well-established literature looking at the relationship between having a chronic health condition during childhood and adolescence and the experience of negative health behaviors (e.g. less fruit and vegetable intake), psychological outcomes (e.g. depressive symptoms, lower self-esteem) and social outcomes (e.g. being teased). Cross-sectional and longitudinal studies have identified associations between childhood/adolescent asthma, diabetes or other chronic health conditions and overweight/obesity [1], depressive symptoms [2], disordered eating behaviors [3] being bullied, isolated or having fewer friends [4]. However, less is known about whether these negative outcomes are experienced by young adults with chronic health conditions, especially those with common conditions such as asthma or diabetes. Due to technological advances in pediatric medicine over the past 40 years, morbidity and mortality have decreased for children with chronic health conditions and the number of young adults and adults with chronic health conditions has increased [5]. Thus, obtaining a more comprehensive understanding of the life experience of young adults with chronic health conditions is important in order to inform prevention efforts and clinical care for these individuals.

The majority of the literature on young adults with chronic health conditions has focused on the transition of health care services from adolescence to adulthood, including whether factors such as collaborative meetings with providers, age of transition and socio-economic status, increase young adults’ success in transitioning to adult health care services [6,7]. Less well understood is whether young adults with chronic health conditions are more likely to experience negative health behaviors and psychosocial outcomes compared to young adults without chronic health conditions. The few studies that have looked at health behaviors and psychosocial outcomes among young adults with chronic health conditions have shown that while young adults with chronic conditions were equally as likely to be married and have children compared to young adults without chronic conditions, they were more likely to be of lower Socio-Economic Status (SES) and receive public assistance and less likely to graduate from high school or be employed [5,8]. As these studies have focused primarily on socio-demographic differences, additional research is needed to understand whether young adults with chronic conditions are differentially likely to experience other negative outcomes such as higher BMI, less healthful behaviors (e.g. unhealthy dietary intake, less physical activity), more psychological problems and increased social stigma. In addition, further study of young adults with chronic conditions is needed to understand whether previous findings related to socio-economic outcomes are consistent across studies.

This study expands on the extant research by examining whether there were differences in weight, health behaviors and psychological

*Corresponding author: Jerica M. Berge, Department of Family Medicine and Community Health, Phillips Wangensteen Building, 516 Delaware Street SE, Minneapolis, MN 55455, Tel: 612-626-3693; E-mail: mohl0009@umn.edu

Received April 02, 2012; Accepted April 28, 2012; Published April 30, 2012

Citation: Berge JM, Bauer KW, Eisenberg ME, Denny K, Neumark-Sztainer D (2012) Psychosocial and Health Behavior Outcomes of Young Adults with Asthma or Diabetes. J Community Med Health Educ 2:144. doi:10.4172/2161-0711.1000144

Copyright: © 2012 Berge JM, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.
and social outcomes among young adults with diabetes or asthma, two of the most common chronic diseases of young adulthood, compared to young adults without a chronic disease. Specific research questions of the current study include:

i) How do young adults with common chronic health conditions (diabetes and asthma) differ from young adults without chronic health conditions in regards to weight status and health behavior outcomes (i.e. fruit and vegetable intake, sugar-sweetened beverage intake, daily breakfast consumption, fast food intake, frequent family meals, unhealthy weight control behaviors, binge eating and physical activity)?

ii) How do young adults with common chronic health conditions differ from young adults without chronic health conditions in regards to psychological health outcomes (i.e. depressive symptoms, self-esteem, body satisfaction)?

iii) How do young adults with common chronic health conditions differ from young adults without chronic health conditions in regards to social outcomes (i.e. educational attainment, romantic relationships, parenthood, being teased)?

Results from this study will inform treatment and public health prevention efforts in order to reduce and/or prevent negative health and psychosocial outcomes in young adults with chronic diseases. Furthermore, findings will inform the types of interventions that may be important to implement during adolescence in order to reduce problems in young adulthood.

Methods
Sample and study design

Data for this analysis were drawn from Project EAT (Eating and Activity in Teens and Young Adults)-III, the third wave of a population-based study designed to examine dietary intake, physical activity, weight control behaviors, weight status and factors associated with these outcomes among young adults (n = 2287). In Project EAT-I (Time 1; 1998-1999), middle school and senior high school students at 31 public schools in the Minneapolis/St. Paul metropolitan area of Minnesota completed surveys and anthropometric measures.9 Five years later (Time 2; 2003-2004), for Project EAT-II, original participants were mailed follow-up surveys to examine changes in their eating patterns, weight control behaviors and weight status as they progressed through adolescence [9]. Project EAT-III (Time 3, 2008-2009) was designed to follow-up on participants again as they progressed from adolescence to young adulthood and through their twenties. Original participants were mailed letters inviting them to complete online or paper versions of the Project EAT-III survey and a food frequency questionnaire.

A total of 1,030 men and 1,257 women completed the Project EAT-III survey, representing 66.4% of participants who could be contacted (48.2% of the original school-based sample). The mean age of the sample at follow-up was 25.3 (range 19.8 – 31.2). All study protocols were approved by the University of Minnesota’s Institutional Review Board. Additional details of the study design have been reported elsewhere [9].

Survey development

The original Project EAT survey [9] that was used to assess determinants of dietary intake and weight status among adolescents was modified and new items were added at Time 3 to improve the relevance of items for young adults as they were transitioning to more independent lifestyles and establishing new careers, households and families. The revised survey was pre-tested by 27 young adults in focus groups and test-retest reliability was examined in a sample of 66 young adults. Details of the survey development process are described elsewhere [9].

Measures

Exposure variables, outcome variables and covariates are described in Table 1.

Statistical analyses

Socio-demographic differences between participants in the three chronic condition groups (asthma, diabetes, no chronic health condition) were examined. Differences in the distribution of categorical variables by chronic condition group were assessed with chi-square tests and ANOVA was used to test differences in the mean level of continuous variables by chronic condition group.

General linear models were run to examine the relationships between the three chronic condition groups and all health and psychosocial measures. A square root transformation of the fast food variable was used due to skewness and geometrical means were obtained by back-transforming the means of the square root-transformed variable. All models were adjusted for participant demographic characteristics (age, race/ethnicity, SES, educational attainment) to control for potential confounders. Additionally, for all outcomes other than BMI, adjustments were made for BMI. For continuous variables, adjusted means were generated across the three different chronic condition groups. For dichotomous variables, adjusted probabilities were generated. When the two degree of freedom F-test indicated that the mean level/probability of the outcome differed by chronic condition group at the p < .05 level, post hoc analyses were conducted. To identify specific differences between levels of the outcome variables by chronic condition group, post-hoc difference tests used the more conservative .01 significance level in light of multiple comparisons.

Because attrition from the baseline sample did not occur at random, in all analyses, the data were weighted using the response propensity method [10]. Response propensities were estimated using a logistic regression of response at Time 3 (EAT-III) on a large number of predictor variables from Project EAT-I (Time 1). The weighting method resulted in estimates representative of the demographic make-up of the original school-based sample, thereby allowing results to be more fully generalizable to the population of young people in the Minneapolis/St. Paul metropolitan area. All analyses were conducted using SAS (version 9.1.3, 2006, SAS Institute Inc, Cary, NC).

Results

The current analysis included 2276 young adults who indicated they had asthma (n = 372), diabetes (n = 61) or neither of these chronic health conditions, referred to as the “no chronic condition group,” (n = 1843) at Time 3 (Table 2). Descriptive results indicated that participants with no chronic condition, asthma, or diabetes did not differ significantly by age, gender or educational attainment, but did differ by race/ethnicity (p < .01).

Health behaviors

Young adults with diabetes had a higher average BMI (mean = 28.7; overall F-test p = 0.035) than those young adults with no chronic health condition (mean = 26.7), but did not differ from young adults with asthma (mean = 27.1) (Table 3). In addition, young adults with diabetes engaged in significantly fewer hours of physical activity per week (mean = 3.38; p = 0.035) compared to young adults with asthma (mean...
To assess frequency of weight-teasing, respondents were asked how often “you are teased about your weight” and “you are teased

Binge eating was assessed using items adapted from a scale by Yanovski [18]. The two questions included: “In the past year, have

“What is the highest level of education that you have completed?” Response options included: less than high school, high school/GED, or more than high school.

“Do you think of yourself as 1) white, 2) black or African-American, 3) Hispanic or Latino, 4) Asian-American, 5) Hawaiian or Pacific Islander, or 6) American Indian or Native American” and respondents were asked to check all that apply. Participants who checked “white” and another option were included in the other category.

Breakfast Frequency

Breakfast Frequency

Physical Activity questions were adapted from the Godin Leisure-Time Exercise Questionnaire [11]. Young adults were asked: “In a usual week, how many hours do you spend doing the following activities: (1) strenuous exercise (e.g. biking fast, aerobics, jogging, basketball, swimming laps, soccer, rollerblading) (2) moderate exercise (e.g. walking quickly, easy bicycling, volleyball, skiing, dancing, skateboarding, snowboarding)”. Response options ranged from “none” to “6+ hours a week”. (Test-retest r = .80).

Depressive Symptoms

A scale by Kandel and Davies [19] was used to measure depressive mood. Participants responded “not at all,” “somewhat,” or “very much” to the following symptoms: fatigue, sleep disturbance, dysthymic mood, hopelessness, feeling tense/nervous, worry. Higher values indicate more severe depressive mood. (Cronbach’s alpha reliability α = 0.83; Test-retest r = 0.73).

Body Satisfaction

Body satisfaction was measured with a five-point (very dissatisfied to very satisfied) modified version of the Body Shape Satisfaction Scale [20]. Young adults rated their level of satisfaction with height, weight, body shape, waist, hips, stomach, face, body build, shoulders, muscles, chest and overall body fat. Higher scores indicated higher levels of body satisfaction. (Chronbach’s alpha reliability α = 0.93; Test-retest r = 0.89).

Self-esteem

Self-esteem was assessed with six items from the Rosenberg Self-Esteem Scale [21], including such items as “on the whole, I am satisfied with myself.” Response options ranged from strongly disagree to strongly agree on a 4-point scale. Higher scores indicated higher levels of self-esteem. (Chronbach’s alpha reliability α = 0.83 respectively; test-retest r = 0.85).

Teasing

To assess frequency of weight-teasing, respondents were asked how often “you are teased about your weight” and “you are teased about your appearance” [22]. Response categories were: (1) never; (2) less than once a year; (3) a few times a year; (4) a few times a month; and (5) at least once a week. A dichotomous variable was created with those answering that they were teased less than once a year or not at all categorized as having not experienced teasing, and those answering a few times a year or greater categorized as having experienced teasing [23]. (Test-retest r = 0.88).

Educational Attainment

“What is the highest level of education that you have completed?” Response options included: less than high school, high school/GED, vocational/technical/trade school, associate degree, bachelor degree, graduate or professional degree [24]. Educational attainment was transformed into a continuous measure. (Test-retest % agreement = 97%).

Significant Other Status

Young adults were asked the following question adapted from a previous measure [25]: “Do you have a significant other (for example, boyfriend, girlfriend, spouse, partner)?” (yes/no). (Test-retest % agreement = 100%).

Children

“How many children do you have (including step-children and adopted children)?” Response options ranged from “none” to “three or more”. This item was dichotomized into < 1 or >1 child. (Test-retest r = 1.0).

Table 1: Exposure variables, outcome variables and covariates.
Table 3: Associations between chronic health conditions and young adult health and psychosocial variables*

<table>
<thead>
<tr>
<th>Health Behaviors and Weight:</th>
<th>No Chronic Condition</th>
<th>Diabetes</th>
<th>Asthma</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI (adjusted mean)</strong></td>
<td>26.7±</td>
<td>28.7±</td>
<td>27.1±</td>
<td>0.035</td>
</tr>
<tr>
<td>**Health Behaviors (adjusted mean):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit &amp; Vegetable Intake (servings/day)</td>
<td>3.79</td>
<td>4.29</td>
<td>3.81</td>
<td>0.437</td>
</tr>
<tr>
<td>Family Meals (times/week)</td>
<td>4.22</td>
<td>4.31</td>
<td>4.12</td>
<td>0.834</td>
</tr>
<tr>
<td>Sugar-sweetened beverages (servings/day)</td>
<td>0.84</td>
<td>0.84</td>
<td>0.86</td>
<td>0.977</td>
</tr>
<tr>
<td>Breakfast (times/week)</td>
<td>3.655</td>
<td>3.88</td>
<td>3.83</td>
<td>0.365</td>
</tr>
<tr>
<td>Fast Food (times/week)</td>
<td>1.80</td>
<td>2.13</td>
<td>2.01</td>
<td>0.183</td>
</tr>
<tr>
<td>Total Physical Activity (hours/week)</td>
<td>4.16</td>
<td>3.38</td>
<td>4.52</td>
<td>0.035</td>
</tr>
<tr>
<td><strong>Disordered Eating Behaviors (adjusted percent):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unhealthy</td>
<td>42.9±</td>
<td>50.3±</td>
<td>47.9±</td>
<td>0.023</td>
</tr>
<tr>
<td>Extreme</td>
<td>16.2</td>
<td>14.1</td>
<td>14.6</td>
<td>0.675</td>
</tr>
<tr>
<td>Binge</td>
<td>11.0±</td>
<td>19.6±</td>
<td>13.5±</td>
<td>0.044</td>
</tr>
<tr>
<td><strong>Psychological:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive Symptoms (adjusted mean)</td>
<td>18.5±</td>
<td>19.8±</td>
<td>18.9±</td>
<td>0.048</td>
</tr>
<tr>
<td>Self-esteem (adjusted mean)</td>
<td>18.4±</td>
<td>17.1±</td>
<td>18.3±</td>
<td>0.008</td>
</tr>
<tr>
<td>Body Satisfaction (adjusted mean)</td>
<td>41.0±</td>
<td>38.5±</td>
<td>41.4±</td>
<td>0.043</td>
</tr>
<tr>
<td><strong>Social:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have Significant Other (adjusted percent)</td>
<td>68.3</td>
<td>63.5</td>
<td>72.0</td>
<td>0.252</td>
</tr>
<tr>
<td>Have Children (adjusted percent)</td>
<td>3.81</td>
<td>2.92</td>
<td>3.87</td>
<td>0.217</td>
</tr>
<tr>
<td>Educational Attainment in Years (adjusted mean)</td>
<td>14.0</td>
<td>13.3</td>
<td>14.0</td>
<td>0.448</td>
</tr>
<tr>
<td>Teasing (adjusted percent):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>44.2</td>
<td>44.8</td>
<td>47.9</td>
<td>0.423</td>
</tr>
<tr>
<td>Appearance</td>
<td>22.7±</td>
<td>37.2±</td>
<td>27.0±</td>
<td>0.038</td>
</tr>
</tbody>
</table>

*Significant levels of depressive symptoms (mean = 19.8; p = 0.38) compared to young adults with no chronic health condition (mean = 18.5) (Table 3). In addition, young adults with diabetes had significantly lower self-esteem (mean = 18.3; p = 0.008) compared to young adults with asthma (mean = 18.5). Furthermore, young adults with diabetes had lower body satisfaction (mean = 38.5; p = 0.043) than young adults with asthma (mean = 41.4) or no chronic health condition (mean = 41.0).

**Social variables**

Young adults with chronic conditions were as equally likely as young adults with no chronic conditions to report having a significant other and children and reported similar levels of educational attainment (Table 3). Young adults with diabetes reported more appearance-based...
Discussion

Overall, results from the current study suggest that young adults with diabetes have a higher prevalence of overweight and negative health behaviors and psychosocial outcomes as compared to young adults with asthma or no chronic diseases. In addition, findings suggest that there was no difference in the prevalence of psychosocial and health behavior outcomes for young adults with asthma as compared to young adults with no chronic condition.

Specifically, results indicated that on average young adults with diabetes had higher BMIs, engaged in less physical activity, were more likely to engage in unhealthy weight control behaviors and binge eating, reported lower self-esteem and body satisfaction, higher depressive symptoms and experienced more appearance-based teasing compared to young adults with asthma or no chronic health conditions, even after adjusting for BMI (except when BMI was the outcome) and other socio-demographic covariates. These findings corroborate past research on children/adolescents with chronic conditions [4,11] indicating that young adults with diabetes have similar negative psychosocial outcomes to children with chronic conditions. Findings from the current study extend past research on young adults with chronic conditions [3,8] in that several health behaviors and psychosocial variables were measured rather than focusing solely on socio-economic variables. This study confirms that young adults with chronic conditions seem to experience similar social successes such as having a significant other, having children and education endeavors as compared to young adults without chronic conditions [3,8] but extends the literature by showing strong positive associations between having diabetes and several negative health behaviors and psychosocial outcomes.

Young adults with diabetes experienced higher BMI and greater negative health behaviors and psychosocial outcomes compared to young adults with asthma. Because both diseases can alter body size and functioning, it is of interest that these two groups were not more similar on outcomes such as self-esteem and body satisfaction, unhealthy weight control behaviors and binge eating, and appearance-based teasing. One potential explanation for this finding may be that individuals with diabetes require a more stringent daily treatment regimen than individuals with asthma, thus, young adults with diabetes may experience more illness-related stressors that impact other domains of their life than young adults with asthma. For example, it may be the case that new technology commonly used in diabetes management (e.g. insulin pumps) are more visible and cumbersome to the individual wearing them and thus individuals may have heightened awareness of their illness and perceive others as to well. In addition, the lower body satisfaction and lower self-esteem in young adults with diabetes may be contributing to the higher appearance-based teasing. Furthermore, the measurement of diabetes and asthma in the current study did not assess for the severity of the health condition, thus, it may be the case that many young adults in the sample had mild asthma and did not experience similar psychological outcomes as young adults with diabetes or moderate to severe asthma.

While young adults with chronic conditions were similar to young adults without chronic conditions on fruit and vegetable intake, sugar-sweetened beverage consumption and eating breakfast, it is of concern that values for all young adults were lower than national recommendations for daily dietary intake, such as five or more fruits and vegetables a day [12]. This is especially problematic for individuals with diabetes, given the added importance of nutritional management in their chronic health condition. Similarly, the higher amounts of unhealthy weight control behaviors and binge eating in young adults with diabetes is concerning. Previous literature on children and adolescents has shown that the prevalence of binge eating, underdosing of insulin to lose weight ("diabulemia"), self-induced vomiting and laxatives was higher in youth with diabetes and these behaviors were associated with impaired metabolic control and retinopathy four years later [3,13]. While disordered eating behaviors have negative consequences for all individuals, they may have more severe consequences for individuals with diabetes in relation to morbidity and mortality and should be avoided.

This study has a number of strengths, one of which is the use of a large, diverse, population-based cohort allowing for generalizability of study findings to other populations of young adults from US metropolitan areas. In addition, this study was able to look at numerous health behaviors and psychosocial variables not available in other studies, providing a more comprehensive picture of the well-being of young adults with chronic conditions. However, findings from the present study must also be interpreted in light of certain limitations. First, the survey used in this study did not assess for the length of time young adults had been diagnosed with a chronic health condition or the severity of the chronic health condition. It may be the case that participants with less severe chronic condition symptoms (e.g. mild asthma) may be less likely to experience negative health behaviors and psychosocial outcomes compared to participants with more severe symptoms. In addition, all measures in the study were self-reported, increasing the likelihood of self-report bias. Objective measures of disease and weight status should be used in future research to confirm the results in the current study. Furthermore, although we were unable to examine longitudinal associations and can not determine causality or temporality, the cross-sectional findings indicate the higher level of risk for numerous outcomes among youth with chronic conditions, particularly diabetes. Thus, these findings indicate a need for preventive efforts, early screening and treatment for negative health behaviors and psychosocial outcomes.

Findings from the current study have several implications for clinical care. First, although providers may already assess for BMI, depressive symptoms or self-esteem during ongoing health exams with patients with diabetes, it may also be important to assess for other negative health behaviors and psychosocial variables such as disordered eating behaviors, appearance-based teasing, or body dissatisfaction. This information would provide a more comprehensive view of the young adult with diabetes and may improve treatment. In addition, identifying these negative health behaviors and psychosocial variables is important because if such stressors exist, collaboration with other specialty providers such as psychiatrists and other mental health providers that specialize in disordered eating behaviors, may improve treatment outcomes. Third, public health researchers should consider interventions that target the prevention of these negative health behaviors and psychosocial outcomes among young adults with diabetes in order to increase their quality of life.

Acknowledgements

Research is supported by grant number R01 HL093247 from the National Heart, Lung and Blood Institute (PI: Dianne Neumark-Sztainer). Dr. Berge’s time is supported by a grant from Building Interdisciplinary Research Careers in Women’s Health (BIRCWH) from the National Institutes of Child Health and Human Development (grant number K12HD055887), administered by the Deborah E. Powell Center for Women’s Health at the University of Minnesota. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Heart, Lung and Blood Institute, the National Institute of Child Health and Human Development, the National Cancer Institute or the National Institutes of Health.
Contributors Statement

All co-authors made a substantial contribution to the paper. Dr. Berge conceptualized the paper, conducted data analysis and interpretation and wrote all drafts of the paper. Dr. Neumark-Sztainer is the principal investigator of Project EAT and assisted in conceptualizing the paper, critically revised the paper and gave final approval of the version to be published. Dr. Bauer assisted with the data analysis and the interpretation of the data. She also critically revised the paper and gave final approval of the version to be published. Dr. Denny assisted the interpretation of the data and critically revised the paper and gave final approval of the version to be published.

Financial Disclosure and Conflict of Interests

All authors have no conflicts of interest, nor financial disclosures to report.

References

16. Welcome to the HSPH Nutrition Department’s File Download Site. Harvard School of Public Health Nutrition Department.