

Asthma Mental Health Report



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Utah Asthma Program

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Executive Summary

The Mental Health and Asthma Report utilizes data from various sources to provide a clear picture of the burden of depression among those with asthma. This report is intended to assist those working with people who have asthma and those working with people who have depression to better understand the interdependence of these health outcomes. Specifically, this report will highlight how having both depression and asthma can worsen health more than either condition alone.

Asthma and depression are important public health issues that can have far-reaching medical, economic, societal, and psychological consequences. Asthma severity can be measured in the number of missed school and work days, missed usual activities, and recent asthma attacks that can lead to emergency department (ED) visits and hospitalizations. Depressive symptoms are associated with worse asthma symptoms and are more common in asthma patients than in the general population or any other general medical condition (Zielinski, 2000). Addressing mental illness in those with asthma will lead not only to better asthma outcomes but also to better mental health outcomes.

Key Findings:

- Adolescents who had an asthma attack in the past year had a higher rate of being depressed or sad most days during the past year (44.2%) when compared to those who had not had an attack in the past year (35.4%).
- Adolescents who missed 1-3 days of school in the past year due to asthma (51.6%) had a higher rate of being depressed or sad most days in the past year than those who missed zero days of school (40.0%).
- Missing school due to asthma reduced the effect of having had an asthma attack in the past year on the likelihood of depression. Missing school also was related to a higher likelihood of depression by 49% (OR: 1.49). In other words, missing school may explain why having an asthma attack is associated with a higher risk of depression.
- Adults with asthma who had symptoms in the past 1-7 days (41.2%) or had symptoms in the past 8+ days (42.8%) had a higher prevalence of depression than the general population who reported ever being told by a health care professional he/she was depressed (21.8%).

Recommendations:

- Asthma specialists should regularly screen their patients for depression using PHQ-9 or another validated depression tool.
- Health care professionals should work together to ensure that patients with asthma have a treatment plan for asthma and depression and are monitoring both conditions in order to determine the most effective treatments.
- Health care professionals should take into consideration how asthma symptoms may impact patient quality of life and mental health.

Introduction

Asthma is one of the most prevalent chronic medical conditions in the United States (EPA, 2013), and depressive symptoms are more common in asthma patients than in the general population or any other general medical condition (Zielinski, 2000). Stress may play a key role in the relationship between asthma and depression because it can be a trigger for both (Calam, 2005). Asthma-related stressors not only increase the risk of worsening asthma symptoms (Chen, 2007), but also the likelihood of becoming depressed. For example, the inability to breathe properly, or worrying about asthma exacerbations that will affect daily life or enjoyable activities, can adversely influence mental health (Goodwin, 2012). Other asthma symptoms related to an increased risk of depression include those who have been diagnosed with asthma more recently (Nauret, 2007), dyspnea, wakening at night, and experiencing asthma morning symptoms (Goldney, 2003).

Asthma and depression are also interdependent. Having both depression and asthma can worsen health more than either condition alone. For example, poor memory, problem solving skills, and a shortened attention span related to depression (Tarbuck, 1995) can make recognizing the need to get medical attention more difficult and therefore make receiving effective treatment for asthma less likely (Goldney, 2003). People with depression also have a harder time concentrating which makes them less likely to keep appointments and take their asthma medications (Goldney, 2003). Not only does depression make medical treatment more difficult for those with asthma but recent findings also indicate that airways are reactive to psychological states like depression. For example, depression has been linked to greater airway instability and asthma exacerbations (Lehrer, 1993). Alternatively, having uncontrolled asthma may worsen depression symptoms by making it difficult to participate in physical activities, especially enjoyable activities, thereby increasing feelings of isolation and depression (Nauert, 2007). Furthermore, regular participation in physical activity improves short- and long-term psychosocial wellbeing by reducing feelings of stress, anxiety, and depression (Warbuton, 2006). This 'feedback loop,' or bidirectional association between asthma and depression, results in ever-worsening physical and mental health (Lehrer, 1993).

Not only does having depression and asthma worsen both health conditions, but both disorders are associated with other adverse outcomes like school or work problems, adverse health behaviors like smoking or lack of exercise, and suicide (Goodwin, 2012). Therefore, every effort should be made to improve screening for depression and asthma while also developing an effective treatment program that addresses both.

The purpose of this report is to highlight adolescents and adults with asthma who have a high rate of depression. Further, this report will identify asthma control indicators and asthma symptoms that are associated with a higher likelihood of being depressed.



Data

Adolescent data come from the Prevention Needs Assessment (PNA). The PNA is a survey which is administered biennially to children in grades 6, 8, 10, and 12 throughout Utah. In 2013, 47,137 children participated in the survey with a response rate of 64.8%. There were 3,693 students who identified as having ever had lifetime asthma. Students who were identified as ever having asthma were included in the analysis. After students were identified as ever having had asthma, depressed students were identified using the question: “In the past year, have you felt depressed or sad MOST days, even if you felt okay sometimes?” Those who answered “yes” were classified as depressed.

Adult data for this report came from the Utah Asthma Callback Survey (ACBS). The Utah ACBS is conducted annually and assesses several components of asthma, including asthma control indicators and asthma symptoms. For the years 2008-2012, 1,796 adults participated in the survey with a response rate of about 70 percent. This sample includes those who have ever been diagnosed with asthma. Due to the strong association between asthma and depression, the ACBS also asks the question, “Has a doctor or other health care provider EVER told you that you have a depressive disorder (including depression, major depression, dysthymia, or minor depression)?” If the respondent answered “Yes”, then he/she was classified as depressed.

Using multivariate regression, two models were constructed to test whether missing school due to asthma reduced the effect of having had an asthma attack in the past year on the likelihood of depression. The first model contained several demographic control variables and the variable of having had an asthma attack in the past year. The second model contained demographic control variables, having had an asthma attack in the past year variable, and missing school due to asthma variable.

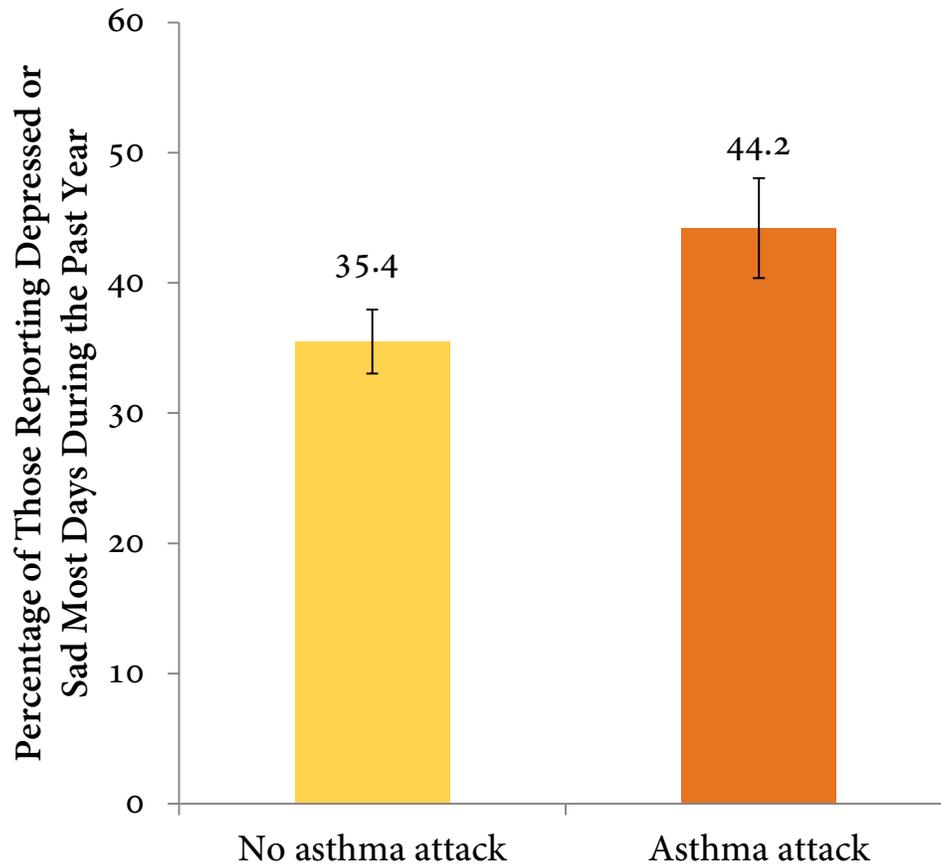
There are several data limitations to be considered in this report. The first is that the depression data may not directly coincide with the asthma data. The depression question asks about ever being diagnosed with depression, while many of the asthma questions assess asthma through more defined and recent time frames.

Secondly, the analyses do not account for those who may have been treated and/or cured of depression, or those with depression who have never been diagnosed. Finally, due to stratification, some groups may have small sample sizes that limit statistical power.

Note: For questions on the report methodology or survey data collection methods, please contact authors.

Results: Adolescents

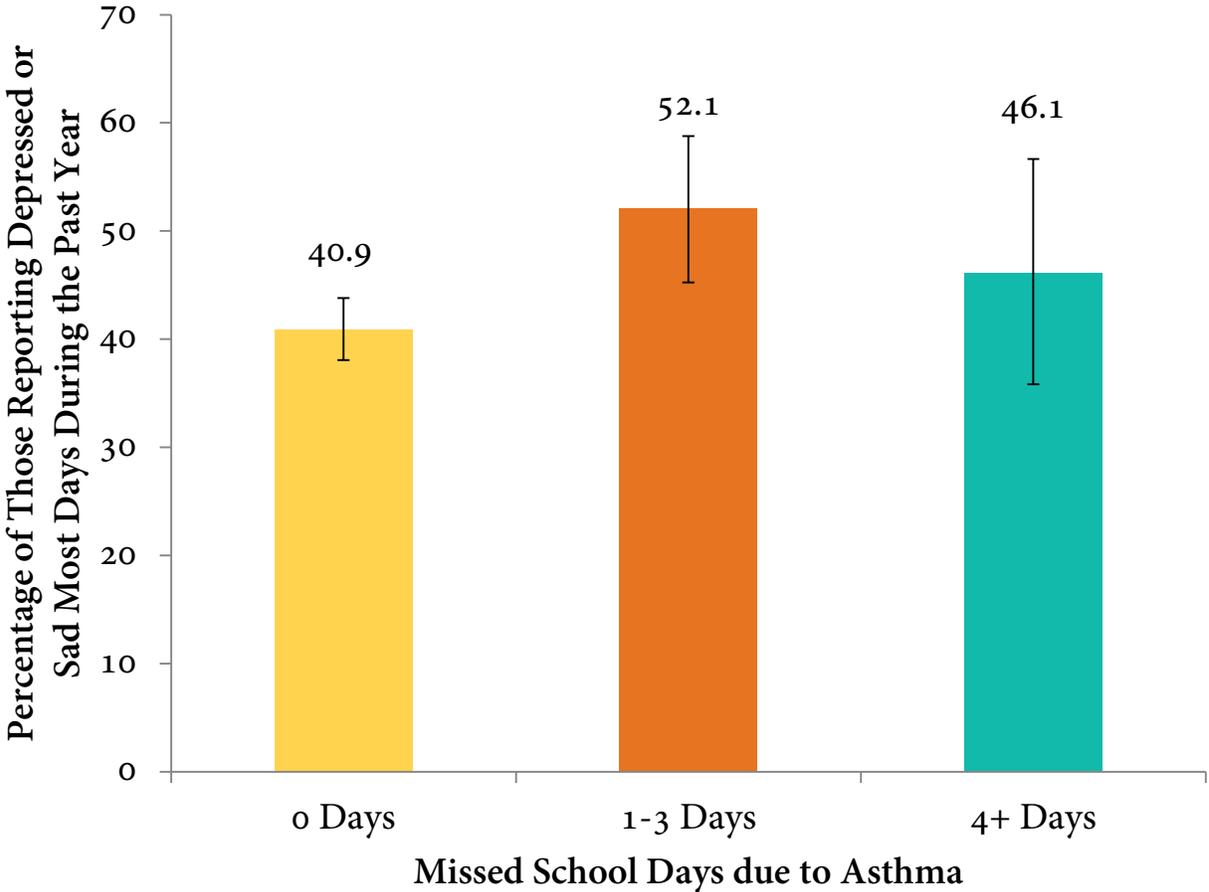
Figure 1. Prevalence of Depression by Asthma Attack in the Past Year, Utah Students in Grades 6,8,10 and 12, 2013.



Source: Prevention Needs Assessment 2013.

- Those who had an asthma attack in the past year had a higher rate of being depressed or sad most days during the past year (44.2%) when compared to those who had not had an attack in the past year (35.4%).

Figure 2. Prevalence of Depression by Number of Missed School Days Due to Asthma in the Last Year, Utah Students in Grades 6,8,10 and 12, 2013.



Source: Prevention Needs Assessment 2013.

- Those who missed 1-3 days of school in the past year due to asthma (52.1%) had a higher rate of being depressed or sad most days in the past year than those who missed zero days of school (40.9%). This difference was statistically significant.
- Those who missed 4+ days of school in the past year due to asthma (46.1%) had a higher rate of being depressed or sad most days in the past year than those who missed zero days of school (40.9%), although the difference was not statistically significant.

Although not presented here, there was no difference in “depressed or sad most days” in the past year among those with an asthma action plan (40%), those without an asthma action plan (40%), and those who were not sure if they had an asthma action plan (40%).

Results: Adolescents

Bivariate analyses of several asthma management indicators showed that only asthma attack in the past year and missed school due to asthma were associated with depressed or sad most days during the past year. Therefore, logistic regression models⁺ were constructed to assess whether having an asthma attack or missing school was associated with depressed or sad most days during the past year while adjusting for possible confounders.

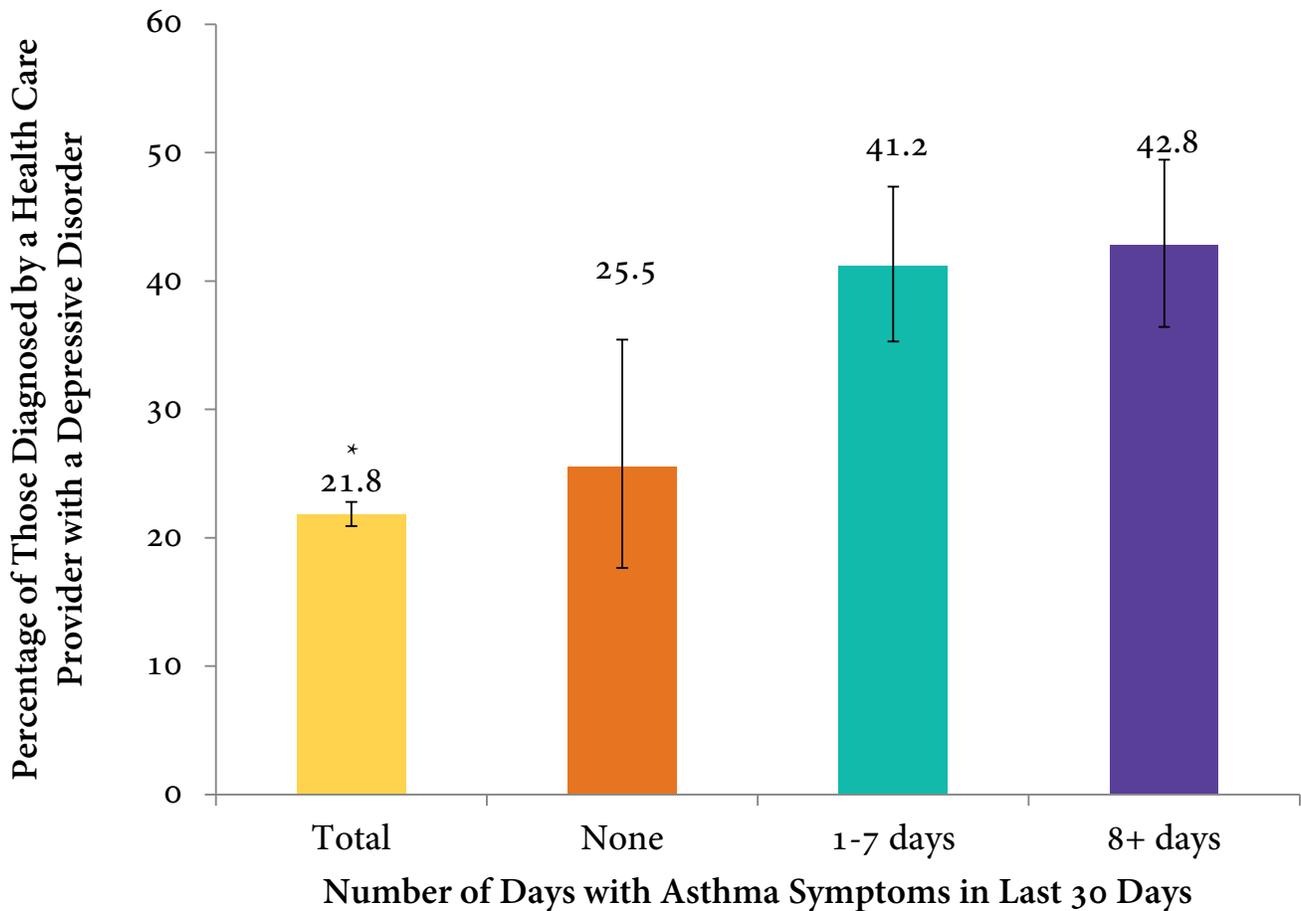
Also, missed school days due to asthma in the past year was tested as a possible mediator between having an asthma attack and depressed or sad most days during the past year, meaning that an asthma attack is associated with an increased risk of depression because it may lead to missed school days.

Results from the regression analysis showed that:

- Those who had an asthma attack in the past year were 40% more likely to report being depressed or sad most days during the past year when compared to those who did not have an asthma attack in the past year.
- Those who missed 1-3 days of school in the past year due to asthma were 49% more likely to report being depressed or sad most days during the past year when compared to those who did not miss any school due to asthma in the past year.
- Missing school due to asthma reduced the effect of having had an asthma attack in the past year on the likelihood of depression. Missing school also was related to high likelihood of depression by 49% (OR: 1.49). In other words, missing school may explain why having an asthma attack is associated with an increased risk of depression.

⁺Note: See Appendix 1 for models

Figure 3. Prevalence of Depressive Disorder by Days with Asthma Symptoms in the Last 30 Days, Utah Adults (18+).



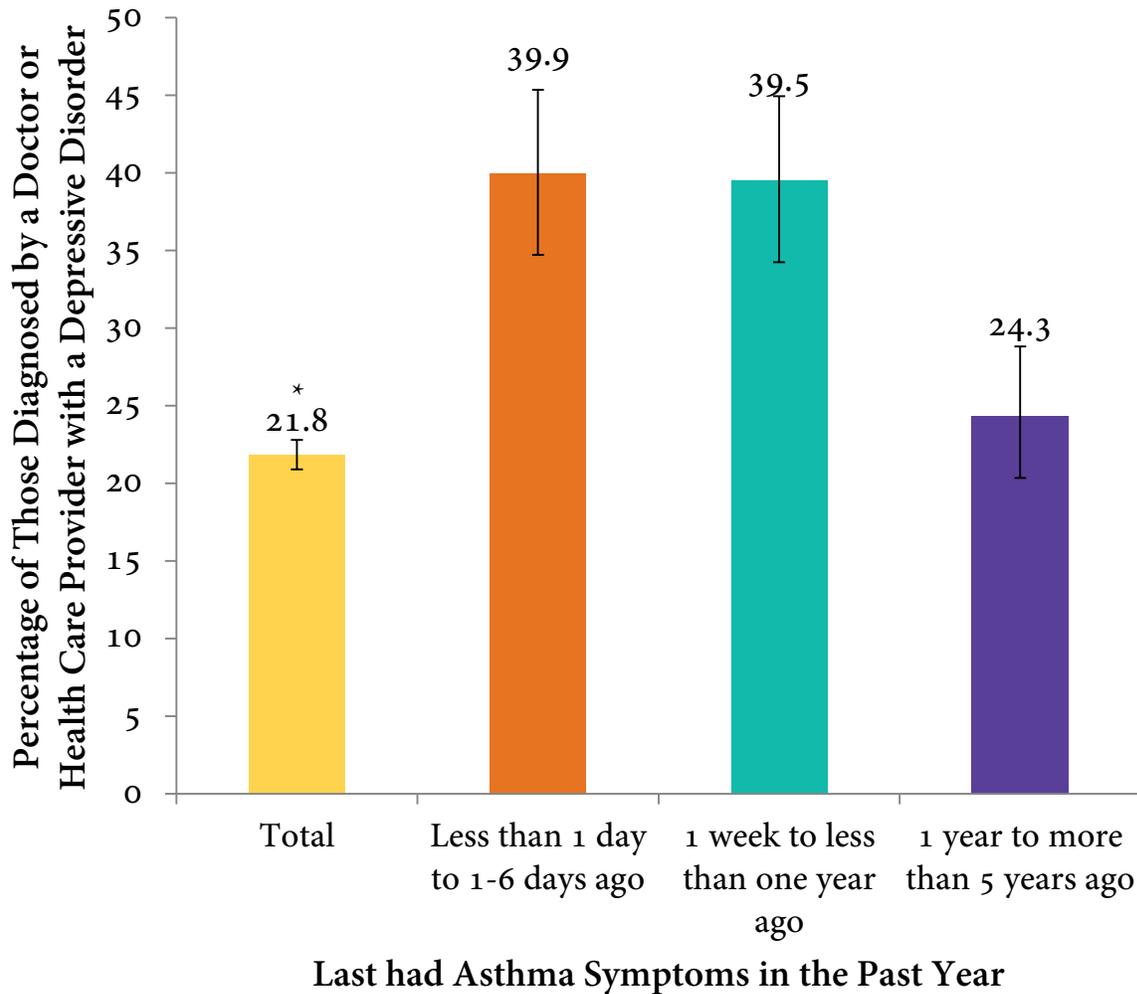
Source: Asthma Callback Survey (ACBS). 2008-2012. Age-adjusted rates.

*Source: Behavioral Risk Factor Surveillance System (BRFSS). 2011. Age-adjusted rates.

- Those who reported 1-7 days of asthma symptoms in the past 30 days (41.2%) had a higher prevalence of being depressed than those with no days of asthma symptoms (25.5%), although the difference was not statistically significant.
- Those who reported 8+ days of asthma symptoms in the past 30 days (42.8%) had a higher rate of being depressed than those who had no symptoms (25.5%). These rates were significantly different.
- Those with asthma (regardless of symptom days) had a higher prevalence of depression (41.2, 42.8) than the general population who reported ever being told by a health care professional he/she was depressed (21.8)*.

Results: Adults

Figure 4. Prevalence of Depressive Disorder by Last had Asthma Symptoms in the Past Year, Utah Adults (18+).

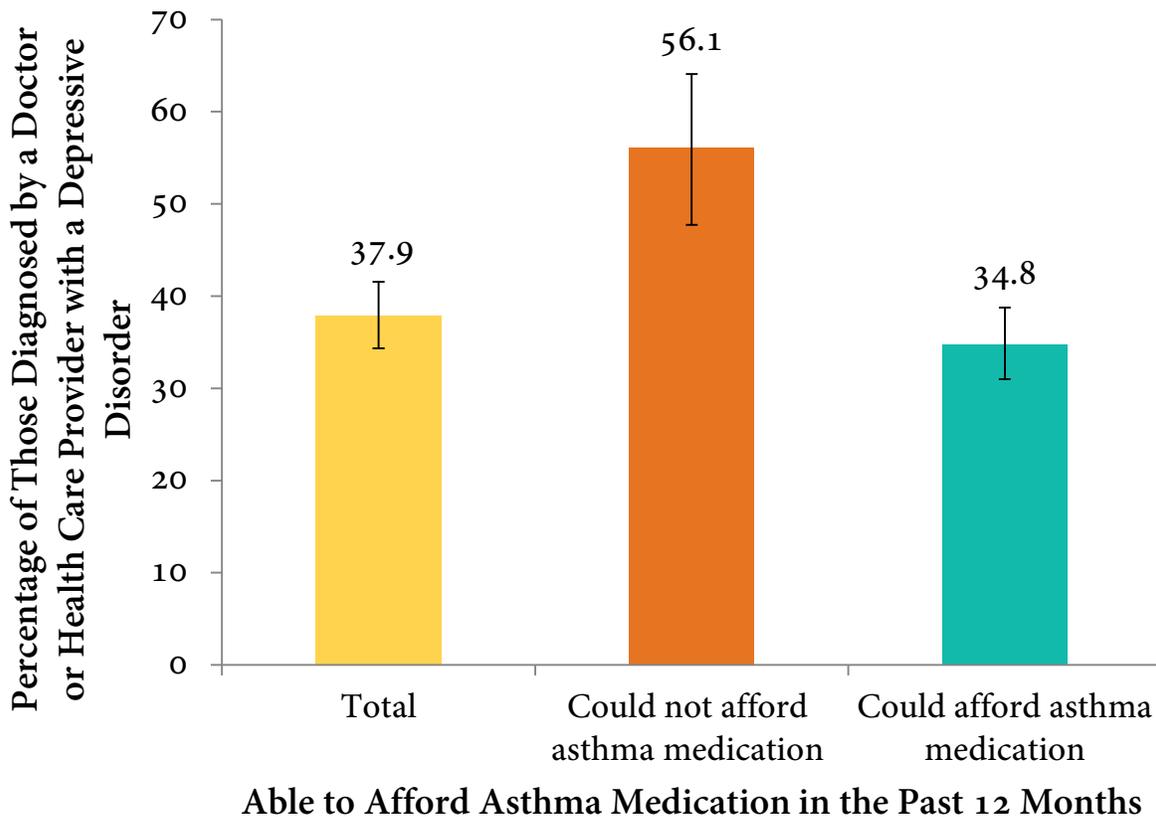


Source: Asthma Callback Survey (ACBS), 2008-2012. Age-adjusted rates.

*Source: Behavioral Risk Factor Surveillance System (BRFSS), 2011. Age-adjusted rates.

- Those who had experienced asthma symptoms less than 1 day to 1-6 days (39.9%) had a higher rate of being depressed than those who had experienced asthma symptoms 1 year to more than 5 years ago (24.3%).
- Those who had experienced asthma symptoms 1 week to less than one year ago (39.5%) had a higher rate of being depressed than those who had experienced asthma symptoms 1 year to more than 5 years ago (24.3%).

Figure 5. Prevalence of Depressive Disorder by Ability to Afford Asthma Medication, Utah Adults (18+).

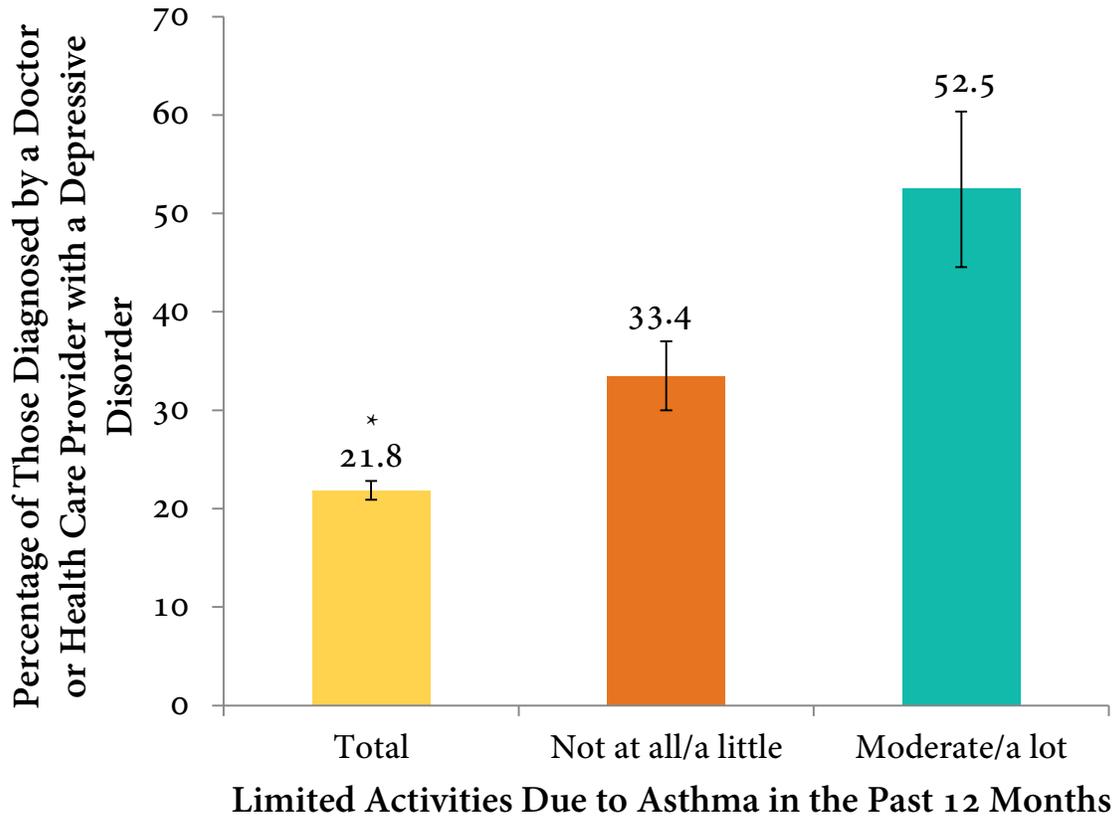


Source: Asthma Callback Survey (ACBS), 2008-2012. Age-adjusted rates.

- Those who could not afford their asthma medication (56.1%) had a higher rate of being depressed than those who could afford their asthma medication (34.8%).
- Those who could not afford their asthma medication (56.1%) had a higher rate of being depressed than the total (37.9%)

Results: Adults

Figure 6. Prevalence of Depressive Disorder by Limited Usual Activities in the Past Year, Utah Adults (18+).

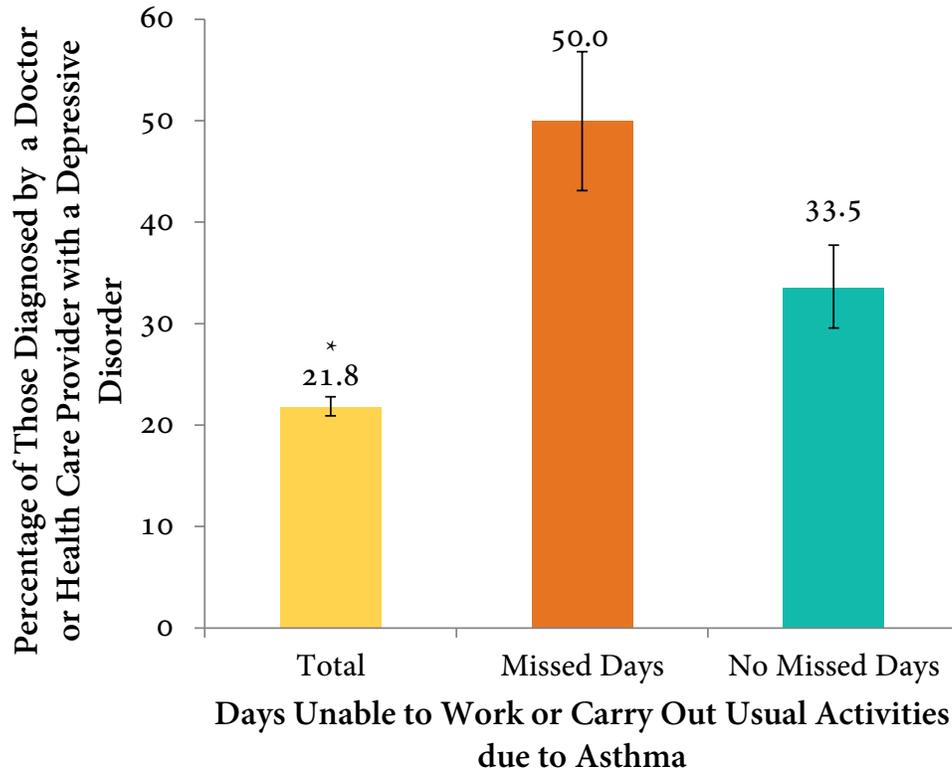


Source: Asthma Callback Survey (ACBS), 2008-2012. Age-adjusted rates.

*Source: Behavioral Risk Factor Surveillance System (BRFSS), 2011. Age-adjusted rates.

- Those who limited their usual activities a moderate amount or a lot due to asthma in the past year (52.5%) had a higher rate of being depressed than those who reported no limitations or only a little (33.4%).
- Those with asthma, regardless of usual activity limitations, had a higher rate of being depressed than the general population (21.8%)*.

Figure 7. Prevalence of Depressive Disorder by Missed Days of Work or Usual Activities in the Past 12 Months, Utah Adults (18+).



Source: Asthma Callback Survey (ACBS). 2008-2012. Age-adjusted rates.

*Source: Behavioral Risk Factor Surveillance System (BRFSS). 2011. Age-adjusted rates.

- Those who missed at least one day of work or usual activities due to asthma within the past 12 months (50.0%) had a higher rate of being depressed than those who missed no days (33.5%).
- Regardless of missed day status, those with asthma had a higher rate of being depressed than the general population (21.8%)*.

Regression analysis[†] found that while controlling for confounders (sex, age, income, last asthma symptom, and difficulty sleeping), missing at least one day of work or usual activities was associated with an increased risk of depression (OR = 2.7).

Other results not included in this report showed no difference in depression prevalence among the following groups: difficulty sleeping vs. no difficulty sleeping; asthma action plan vs. no asthma action plan; routine check-up in the past year vs. no routine check-up in the past year, and ER or urgent care visit in the past year vs. no ER or urgent care visit in the past year.

[†]Note: See Appendix 2 for model

Conclusion

For adolescents and adults, missing daily activities (e.g., school, work, or usual activities) due to asthma meant a higher rate of depression than for those who did not miss such activities. Missing daily activities can affect well-being when regular and/or enjoyable activities are impaired by asthma (Warburton, 2006). In contrast, there was no difference in depression rates among groups measuring preventive care (action plans and routine checkups) and ER/urgent care visits. There were also no differences in depression rates among preventive care and ER/urgent care outcomes. However, differences found in depression rates for recent asthma attacks and missing daily activities suggest that some asthma outcomes may affect quality of life more than others (Goldney, 2003).

A review of the literature found that only certain symptoms of asthma may be related to depression due to their effects on quality of life (Goldney, 2003). This makes sense considering that preventive care and even ER/urgent care visits are events that tend to have temporary effects or no effects on long-term enjoyable activities or quality of life. In contrast, having regular asthma attacks or missing daily activities can have long-term impacts on enjoyable activities, resulting in a perceived lower quality of life and an increased risk for depression. It should be noted that data from this report suggest that, after a period of time being symptom-free, the likelihood for depression returns to the same level as for those without asthma. For example, adults who had experienced asthma symptoms at least 1 year to 5 years prior had a rate of depression similar to that of the general population.

Also of note is the reported additive effect of having not only asthma, but also having recent asthma symptoms on an increased risk for depression. Having asthma was associated with higher rates of depression for both adolescents and adults when compared to the general population. Also, experiencing more recent asthma symptoms or missing daily activities (school/work/usual activities) seemed to be related to an increased risk. For example, for both adults and adolescents, those who had asthma and more recent asthma symptoms or had missed school/work/

usual activities had higher rates of depression than those who had asthma only. Also, for adolescents, having an asthma attack in the past year meant an increased likelihood of missing school and therefore a higher risk of depression.

Approaching co-morbid chronic conditions like asthma and depression with the understanding of their bidirectional associations can result in better physical and mental health. Both asthma and depression can be treated, but first need to be recognized and diagnosed by a health care professional. Asthma specialists should regularly screen their patients for depression using PHQ-9 or another validated depression tool. Health care professionals should work together to ensure that their patients have a treatment plan for asthma and depression and are monitoring both conditions in order to determine the most effective treatments. Furthermore, health care professionals should take into consideration during treatment how asthma symptoms may impact quality of life and mental health due to missing daily activities, and help create a solution for patients to mitigate this problem. Patients can also play an important role in their treatment. Patient responsibilities should include: learning relaxation techniques, getting asthma under control so he/she can participate in enjoyable activities and attend daily activities, seeking support from family and friends, and visiting their doctors regularly to review both asthma and depression conditions (Asthma Australia). Addressing mental health and asthma together will have far reaching impacts medically, economically⁺, socially, and psychologically.

⁺See “Asthma-related Emergency Department Costs in Utah” report: (<http://health.utah.gov/asthma/pdfs/data/EDCostReport.pdf>)

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Appendices

Appendix 1: Asthma Management Predictors of Depressed or Sad Most Days during the Past Year, Utah Students Grades 6, 8, 10, and 12. Odds Ratio and 95% Confidence Interval.

Asthma Severity and Demographic Predictors of Adolescent Depression in the Last Year. Odds Ratio and 95% Confidence Interval.		
	<i>Model 1</i>	<i>Model 2</i>
Female vs. Male	1.90 (1.58-2.28)	1.79 (1.45-2.22)
8th grade vs. 6th grade	1.10 (.86-1.43)	1.17 (.87-1.56)
10th grade vs. 6th grade	1.13 (.87-1.47)	1.05 (.76-1.41)
12th grade vs. 6th grade	1.15 (.88-1.50)	1.16 (.85-1.58)
American Indian/Alaska Native vs. White	2.33 (1.15-4.72)	2.22 (1.00-4.97)
Asian vs. White	1.56 (.60-4.09)	1.96 (.64-6.02)
Black or African American vs. White	0.99 (.52-1.85)	.94 (.46-1.92)
Hispanic or Latino vs. White	2.06 (1.53-2.77)	1.90 (1.33-2.72)
Native Hawaiian vs. White	.70 (.36-1.36)	.55 (.23-1.29)
Other vs. White	1.27 (.96-1.69)	1.13 (.83-1.56)
Had an asthma attack in the last year vs. No asthma attack in the last year	1.40 (1.15-1.70)	1.16 (.93-1.45)
1-3 days of missed school due to asthma vs. No missed days		1.49 (1.09-2.03)
4+ days of missed school due to asthma vs. No missed days		1.14 (.71-1.82)
Source: PNA, 2013.		
<i>Highlighted areas represent significantly different effects between groups at the $p < .01$</i>		

Appendix 2: Asthma Severity and Demographic Predictors of Medical Doctor (MD) Ever Diagnosed Depression. Odds Ratio and 95% Confidence Interval.

Asthma Severity and Demographic Predictors of MD Ever Diagnosed Depression. Odds Ratio and 95% Confidence Interval.	
	<i>Model 1</i>
Female vs. Male	1.28 (.061-2.70)
Age	1.00 (.98-1.02)
Income \$25,001-\$50,000 vs. \$15,000-\$25,000	1.19 (.47-3.02)
Income \$50,001+ vs. \$15,000-\$25,000	.48 (.21-1.07)
Missed days of work/usual activities vs. No missed days†	2.74 (1.31-5.76)
Last asthma symptom 1 week to >1 year vs. >1 day to 6 days	2.05 (.93-4.50)
1 to 7 days of difficulty sleeping vs. No days of difficulty sleeping††	.90 (.38-2.11)
8 to 31 days of difficulty sleeping vs. No days of difficulty sleeping††	1.78 (.69-4.59)
<i>Source: ACBS, 2008-2012</i>	
<i>Highlighted areas represent significantly different effects between groups at p<.01</i>	

†Missed work or usual activities due to asthma at least once during the last year

††Days of difficulty sleeping due to asthma during the past 30 days



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