**Supplemental Tables:**

**Table S1. Multivariate association of asthma self-management education with select characteristics, asthma control, and adverse asthma outcomes among ever-employed adults with possible work-related asthma**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Characteristics | Ever taken course/class to manage asthma | Ever been given an asthma action plan | Shown how to use an inhalera  | Taught how to recognize early signs or symptoms of an asthma episode | Taught what to do during an asthma episode or attack | Taught how to use a peak flow meter to adjust daily medications | Advised to change things in home, school, or work to improve asthma |
| PRb | (95% CI) | PR**b** | (95% CI) | PRb | (95% CI) | PRb | (95% CI) | PRb | (95% CI) | PRb | (95% CI) | PRb | (95% CI) |
| Age group (years) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  18–44 | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
|  45–64 | 1.28 | 0.77–2.12 | 0.95 | 0.78–1.15 | 0.99 | 0.98–1.01 | **0.90** | **0.83–0.98** | 0.96 | 0.90–1.02 | 0.93 | 0.81–1.06 | 1.02 | 0.87–1.21 |
|  ≥ 65 | 1.09 | 0.50–2.38 | **0.71** | **0.55–0.91** | 0.96 | 0.92–1.00 | **0.85** | **0.77–0.94** | **0.91** | **0.84–0.98** | 0.87 | 0.73–1.03 | **0.67** | **0.53–0.85** |
| Sex |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Male | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
|  Female | 1.23 | 0.85–1.80 | **1.3** | **1.05–1.61** | 1.03 | 1.00–1.06 | **1.13** | **1.03–1.24** | **1.13** | **1.05–1.21** | 1.08 | 0.94–1.24 | **1.32** | **1.11–1.57** |
| Race/Ethnicity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  White, non-Hispanic | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
|  Black, non-Hispanic | **1.91** | **1.18–3.08** | 1.09 | 0.82–1.44 | 0.99 | 0.96–1.02 | 1.1 | 0.99–1.22 | 1.08 | 1.00–1.16 | 1.2 | 0.98–1.47 | 0.87 | 0.65–1.16 |
|  Hispanic | **–** |  | 0.77 | 0.46–1.30 | 0.98 | 0.92–1.04 | 0.88 | 0.70–1.11 | 0.98 | 0.84–1.14 | 1.21 | 0.91–1.61 | 0.89 | 0.59–1.33 |
|  Other, non-Hispanic | – |  | 1.22 | 0.81–1.84 | 1 | 0.97–1.03 | 1.01 | 0.83–1.22 | 1.00 | 0.89–1.12 | 1.33 | 1.02–1.72 | 1.3 | 0.92–1.83 |
| Education level |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  ≤ High school | 0.99 | 0.58–1.68 | 1.01 | 0.82–1.25 | 1.01 | 0.98–1.03 | 0.94 | 0.86–1.03 | 0.95 | 0.88–1.01 | 1.03 | 0.88–1.20 | **0.8** | **0.65–0.98** |
|  > High school | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
| Household income |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  < $25,000 | 1.19 | 0.69–2.07 | 0.95 | 0.75–1.20 | 0.97 | 0.93–1.00 | 0.92 | 0.83–1.02 | **0.88** | **0.81–0.95** | 1.04 | 0.88–1.23 | 0.83 | 0.67–1.03 |
|  $25,000–$49,999 | **1.71** | **1.02–2.86** | 0.97 | 0.76–1.24 | 1 | 0.98–1.01 | 0.97 | 0.88–1.08 | 0.98 | 0.91–1.05 | 0.99 | 0.84–1.17 | **0.79** | **0.64–0.96** |
|  ≥ $50,000 | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
| Health insurance |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Yes | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
|  No | – |  | 0.8 | 0.55–1.16 | 0.98 | 0.94–1.03 | 0.96 | 0.82–1.12 | 0.93 | 0.81–1.06 | 0.83 | 0.64–1.10 | 0.92 | 0.68–1.24 |
| Employment status |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Currently employed | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
|  Not currently employed | 1.27 | 0.75–2.16 | 1.06 | 0.86–1.31 | 1.02 | 1.00–1.04 | 1.01 | 0.92–1.11 | 1.01 | 0.94–1.09 | 1.05 | 0.90–1.22 | **1.21** | **1.01–1.45** |
| **Asthma control** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Well controlled | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  | 1.00 |  |
|  Not-well-controlled | 1.05 | 0.68–1.62 | 1.07 | 0.87–1.32 | 1.00 | 0.98–1.02 | 0.96 | 0.87–1.06 | 0.96 | 0.89–1.04 | 0.97 | 0.83–1.13 | 1.06 | 0.88–1.28 |
|  Very poorly controlled | 1.42 | 0.88–2.31 | 1.2 | 0.98–1.49 | 0.98 | 0.95–1.00 | 1.02 | 0.93–1.11 | 1.03 | 0.97–1.10 | **1.16** | **1.00–1.34** | **1.29** | **1.07–1.56** |
| **Adverse asthma outcomes**c |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Asthma attack | 1.12 | 0.75–1.67 | 1.11 | 0.93–1.33 | 1.00 | 0.98–1.02 | 1.05 | 0.97–1.13 | **1.08** | **1.02–1.15** | 0.94 | 0.83–1.07 | 0.97 | 0.83–1.13 |
|  Urgent treatment for worsening asthma | 1.23 | 0.85–1.79 | **1.48** | **1.25–1.75** | 1.01 | 0.98–1.03 | **1.17** | **1.10–1.26** | **1.14** | **1.09–1.20** | **1.16** | **1.01–1.32** | 1.09 | 0.92–1.28 |
|  Asthma-related emergency room visit | 1.31 | 0.76–2.25 | **1.40** | **1.10–1.78** | 0.98 | 0.95–1.02 | **1.16** | **1.05–1.28** | **1.10** | **1.02–1.18** | 1.18 | 0.97–1.44 | 1.19 | 0.92–1.56 |
|  Overnight stay in hospital because of asthma | 1.78 | 0.66–4.79 | 1.44 | 0.98–2.12 | 0.98 | 0.90–1.05 | 1.08 | 0.87–1.34 | 1.02 | 0.85–1.23 | 1.27 | 0.96–1.68 | 1.11 | 0.71–1.74 |

a Among adults who have ever used an inhaler; 96.5% of ever-employed adults with current asthma had ever used an inhaler.

b Prevalence ratio represents the probability of self-education among persons with the individual characteristic as compared with persons with no characteristic. For each model, the outcome variable was asthma self-education element and the predictor variable was the individual characteristic adjusted for age, sex, race/ethnicity, education, household income, health insurance, and current employment status.

c In the 12 months prior to the interview.

**Table S2. Multivariate association of asthma control and adverse asthma outcome with WRA status among ever employed adults with current asthma, by asthma self-management education form**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Characteristics | Ever taken course/class to manage asthma | Ever been given an asthma action plan | Shown how to use an inhaler among those who had ever used an inhaler |  Taught how to recognize early signs or symptoms of an asthma episode | Taught what to do during an asthma episode or attack |
| Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) |
| **Poorly controlled asthma** |  |  |  |  |  |  |  |  |  |  |
| WRA | **1.4 (1.2–1.8)** | **1.4** (**1.2–1.5)** | **1.4** (**1.2–1.6)** | **1.4(1.2–1.6)** | **1.4** (**1.3–1.5)** | 1.3(0.8–1.9**)** | **1.4** (**1.3–1.6)** | **1.3** (**1.1–1.6)** | **1.4** (**1.3–1.6)** | **1.3** (**1.0–1.7)** |
| Possible WRA | 1.2 (1.0–1.5) | **1.3** (**1.2–1.4)** | **1.2** (**1.1–1.4)** | **1.3** (**1.2–1.4)** | **1.3** (**1.2–1.4)** | 1.2(0.9–1.6**)** | **1.3** (**1.2–1.4)** | **1.3** (**1.1–1.5)** | **1.3** (**1.2–1.4)** | **1.3** (**1.1–1.5)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| **Adverse asthma outcomes**b |  |  |  |  |  |  |  |  |  |  |
|  Asthma attack |  |  |  |  |  |  |  |  |  |  |
| WRA | **1.5** (**1.2–1.9)** | **1.6** (**1.4–1.7)** | **1.6** (**1.4–1.9)** | **1.5** (**1.4–1.7)** | **1.6** (**1.5–1.7)** | **1.4** (**1.0–2.0)** | **1.6** (**1.5–1.8)** | **1.5** (**1.2–1.8)** | **1.6** (**1.4–1.7)** | **1.6** (**1.2–2.1)** |
| Possible WRA | **1.5** (**1.2–1.9)** | **1.3** (**1.2–1.4)** | **1.3** (**1.1–1.5)** | **1.3** (**1.2–1.4)** | **1.3** (**1.2–1.4)** | 1.3 (1.0–1.6**)** | **1.4** (**1.3–1.5)** | **1.2** (**1.0–1.4)** | **1.4** (**1.2–1.5)** | 1.1 (0.9–1.4**)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
|  Urgent treatment for worsening asthma |  |  |  |  |  |  |  |  |  |  |
| WRA | **2.1** (**1.5–3.0)** | **2.0** (**1.7–2.4)** | **1.8** (**1.5–2.3)** | **2.1** (**1.7–2.6)** | **2.1** (**1.8–2.4)** | **2.5** (**1.3–4.7)** | **2.1** (**1.7–2.4)** | **1.6** (**1.2–2.2)** | **2.0** (**1.7–2.3)** | **2.0** (**1.3–3.1)** |
| Possible WRA | **1.5** (**1.1–2.1)** | **1.3** (**1.1–1.5)** | **1.2** (**1.0–1.5)** | **1.4** (**1.1–1.6)** | **1.3** (**1.1–1.5)** | 1.7 (1.0–3.0**)** | **1.3** (**1.1–1.5)** | **1.5** (**1.2–1.9)** | **1.3** (**1.1–1.5)** | **1.7** (**1.3–2.3)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
|  Asthma-related emergency room visit |  |  |  |  |  |  |  |  |  |  |
| WRA | **1.7** (**1.0–2.9)** | **2.0** (**1.6–2.7)** | **1.7** (**1.2–2.4)** | **2.2** (**1.6–3.0)** | **2.0** (**1.6–2.6)** | - | **1.9** (**1.4–2.5)** | **2.2** (**1.3–3.7)** | **1.9** (**1.5–2.5)** | **2.0** (**1.0–4.1)** |
| Possible WRA | 1.5 (0.9–2.4**)** | **1.4** (**1.1–1.7)** | **1.4** (**1.0–2.0)** | **1.3** (**1.0–1.8)** | **1.4** (**1.1–1.8)** | 1.3 (0.6–2.6**)** | **1.5** (**1.2–1.9)** | 1.2 (0.9–1.7**)** | **1.4** (**1.1–1.8)** | 1.3 (0.8–2.1**)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
|  Overnight stay in hospital because of asthma |  |  |  |  |  |  |  |  |  |  |
| WRA | - | **1.9** (**1.2–2.9)** | 1.6 (0.8–3.1**)** | **2.0** (**1.1–3.4)** | **1.9** (**1.2–2.9)** | - | **2.0** (**1.2–3.3)** | 1.1 (0.5–2.4**)** | **2.0** (**1.3–3.2)** | - |
| Possible WRA | - | 1.3 (0.8–2.2**)** | 1.2 (0.6–2.2**)** | 1.4 (0.7–2.5**)** | 1.3 (0.8–2.1**)** | - | 1.6 (0.9–2.7**)** | 0.5 (0.3–1.1**)** | 1.4 (0.8–2.3**)** | - |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

**Table S2 (Continued). Multivariate association of asthma control and adverse asthma outcome with WRA status among ever employed adults with current asthma, by asthma self-management education form**

|  |  |  |
| --- | --- | --- |
| Characteristics | Taught how to use a peak flow meter to adjust daily medications | Advised to change things in home, school, or work to improve asthma |
| Yes | No | Yes | No |
| PR (95% CI) | PR (95% CI) | PR (95% CI) | PR (95% CI) |
| **Poorly controlled asthma** |  |  |  |  |
| WRA | **1.4** (**1.2–1.6)** | **1.4** (**1.2–1.7)** | **1.3 (1.2–1.6)** | **1.3 (1.2–1.5)** |
| Possible WRA | **1.3** (**1.1–1.4)** | **1.3** (**1.2–1.4)** | **1.2 (1.1–1.4)** | **1.3 (1.2–1.4)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 |
| **Adverse asthma outcomes**b |  |  |  |  |
|  Asthma attack |  |  |  |  |
| WRA | **1.7**(**1.5–1.9)** | **1.5** (**1.3–1.7)** | **1.7 (1.5–1.9)** | **1.4 (1.3–1.6)** |
| Possible WRA | **1.4** (**1.3–1.6)** | **1.2** (**1.1–1.3)** | **1.4 (1.2–1.5)** | **1.3 (1.1–1.4)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 |
|  Urgent treatment for worsening asthma |  |  |  |  |
| WRA | **2.1** (**1.8–2.6)** | **1.9** (**1.5–2.4)** | **2.3 (1.9–2.8)** | **1.7 (1.4–2.2)** |
| Possible WRA | **1.3** (**1.1–1.6)** | **1.3** (**1.1–1.6)** | **1.3 (1.1–1.6)** | **1.3 (1.1–1.5)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 |
|  Asthma-related emergency room visit |  |  |  |  |
| WRA | **2.0** (**1.5–2.8)** | **1.8** (**1.3–2.7)** | **1.9 (1.3–2.7)** | **1.8 (1.3–2.4)** |
| Possible WRA | **1.5** (**1.1–2.0)** | 1.3 (0.9–1.8**)** | 1.1 **(**0.8–1.6**)** | **1.5 (1.2–2.0)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.0 |
|  Overnight stay in hospital because of asthma |  |  |  |  |
| WRA | **2.1** (**1.1–3.7)** | 1.4 (0.8–2.6**)** | 1.9 **(**0.9–4.0**)** | 1.5 **(**0.9–2.6**)** |
| Possible WRA | 1.4 (0.8–2.5**)** | - | 1.1 **(**0.6–2.3**)** | 1.2 **(** 0.7–2.2**)** |
| Non-WRA | 1.0 | 1.0 | 1.0 | 1.00 |

a Prevalence ratio represents the probability of having poor control/adverse asthma outcome among those with WRA/possible WRA compared to those with non-WRA, by education component adjusted for age, sex, race/ethnicity, education, household income, health insurance, and current employment status.

 b In the 12 months prior to the interview.