Title:
Cognitive Concepts Predicting Medication Adherence and Asthma Control in Inner-City Adolescents

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Keywords: adolescents with asthma, medication adherence and social cognitive theory

References:


**Abstract Summary:**
Participants will have the opportunity to learn how cognitive processes affect medication adherence and symptom control in inner-city adolescents with asthma. Participants will also have a chance to ask the researcher about the project and study outcomes.

**Learning Activity:**

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVES</th>
<th>EXPANDED CONTENT OUTLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The learner will be able to understand the relationships among cognitive factors proposed in the Social Cognitive Theory.</td>
<td>Relationship among self-efficacy, outcome expectancy and impediment perceptions will be presented.</td>
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<tr>
<td>The learner will be able to describe the relationships between cognitive concepts and medication adherence and symptom control.</td>
<td>The extent to which cognitive factors influence medication adherence and symptom control will be described.</td>
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</tbody>
</table>

**Abstract Text:**

**Purpose:** Asthma is the most common chronic health condition in adolescents. Poor adherence to treatment is often attributable to high asthma-related morbidity in inner-city adolescents. According to Social Cognitive Theory (SCT), individuals' behavior (e.g., medication adherence) is influenced by cognitive factors such as outcome expectancy, self-efficacy and the perceptions of personal/environmental impediments. Adolescents with higher self-efficacy are more likely to adhere to their asthma treatment.1-5 Outcome expectancy is also associated with adherence to desired behaviors, resulting in better health outcomes.6-8 Yet, little is known about the extent to which outcome expectancy and perceptions of impediments affect medication adherence and asthma control in adolescents with asthma. Furthermore, the relationships among the three cognitive concepts of SCT remain to be examined. The aims of this study were: (1) to examine the relationships between the three cognitive factors; and (2) to determine the extent to which three cognitive factors (self-efficacy, outcome expectancy and impediment perception) predict medication adherence and asthma control in inner-city adolescents.

**Methods:** Subject eligibility criteria included (1) age between 12-20 years; (2) diagnosed asthma that has required health service use (preventive or acute) within 12 months prior to enrollment; (3) persistent asthma; (4) no other chronic medical conditions requiring daily medication; (5) primary residence located in inner cities; and (6) ability to understand spoken and written English. Participants were recruited from Buffalo NY (n=123), Baltimore MD (n=100), and Memphis TN (n=66). Modified asthma expectancy scale measures the cognitive constructs of SCT.9 The scale consists of three subscales, outcome expectancy (α=.76), self-efficacy (α=.69) and impediment perception (α=.70). For medication adherence, Horne’s Medication adherence report scale (MARS, α=.76),10 was used in combination with the self-reported number of days preventive medication were used in the past 4 weeks. To assess asthma control, four impairment-based criteria (symptoms, nocturnal awakening, activity limitations and rescue inhaler use) were measured on a 4-point scale. Pearson correlations were computed to examine the relationships among the three cognitive concepts. Multiple regression analyses were conducted to examine the extent to which the cognitive factors predicted adolescents’ medication adherence and asthma control. The
regression models included sociodemographic factors (gender, age and household income) and age at the first asthma diagnosis as covariates.

**Results:** Of 289 inner-city adolescents (mean age=14.591.92) who participated in the study, 51% were female, most (>83%) were black, and 71% had public health insurance. The majority reported either not well controlled (51%) or very poorly controlled asthma (35%), and 71% (n=204) were on at least one preventive medication. The most common reason for not taking preventive medication was forgetfulness (42%) followed by “don’t need it” (36%). Self-efficacy was positively associated with outcome expectancy (r=0.52, p<.001) and negatively with impediment perception (r=-0.18, p=.002). No significant relationship was found between outcome expectancy and impediment perception. In regression models where each cognitive factor was considered separately, after controlling for covariates, medication adherence scale was predicted by impediment perception (B=-0.427, p=.004), and actual number of adherence days in the past month was predicted by outcome expectancy (B=0.185, p=.027) and self-efficacy (B=0.178, p=.03). Symptom control was also predicted by self-efficacy (B=-0.031, p=.017) and impediment perception (B=-0.024, p=.022). In a full model where all three cognitive factors were considered simultaneously along with the covariates, self-efficacy and outcome expectancy were no longer significant predictors of medication adherence or asthma control. However, impediment perception remained a significant predictor of medication adherence (B=0.08, p=.006), suggesting that as impediments increase adherence decreases. Medication adherence was higher in males (B=1.32, p=.013), and the number of preventive medications uses in the past month was greater in those from higher household income (B=0.13, p=.042) and lower in those whose asthma was diagnosed later in life (B=-0.08, p=.003). Symptom control was greater in those who were older (B=-0.02, p=.04), who were from higher income families (B=-0.03, p=.004), and whose asthma was diagnosed later in life (B=-0.01, p=.021).

**Conclusion:** Three cognitive factors including outcome expectancy, self-efficacy and impediment perceptions are associated with each other and influence medication adherence and/or symptom control in adolescents with asthma. The relationships, to some extent, appear to be accounted for by sociodemographic factors and age at diagnosis, suggesting the importance of understanding cognitive factors in the context of the circumstantial factors. These findings support the SCT’s major assertion that individuals’ behaviors are influenced by cognitive factors and their complex interplay with other inter- and intra-personnel factors. This study underscores the need for tailored interventions taking into account individuals’ gender, age and SES as well as chronicity of asthma, which can modify cognitive factors to promote medication adherence and asthma outcomes in inner-city adolescents.