



Youth secrets are associated with poorer sleep and asthma symptoms via negative affect



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ABSTRACT

Objective: Among older children and adolescents, keeping secrets from parents is consistently associated with lower levels of psychological well-being. Further, concealing one's thoughts and emotions has been associated with poor physical health outcomes in adults. However, it remains an open question whether secret-keeping is associated with poorer health and health-related behaviors (such as sleep) among youth and, if those hypothesized links exist, what the psychological mechanisms might be. We investigated the associations among youth secrecy towards parents, daily asthma symptoms and daily sleep behaviors in a sample of low-income youth with asthma aged 10–17 and tested negative affect as a possible mediator of these associations.

Methods: One hundred and seventy two youths reported the extent to which they kept secrets towards parents over a period of four days. Asthma symptoms, nighttime awakenings, sleep onset latency, and subjective sleep quality were assessed with daily diaries completed by youths.

Results: More frequent secret-keeping was associated with more severe asthma symptoms, lower ratings of sleep quality and greater number of nighttime awakenings. Secrecy was also associated with increased negative affect, which accounted for the associations between secrecy and number of awakenings and daytime asthma symptoms. These findings remained significant after controlling for youth age and other relevant demographic factors. **Conclusions:** Our findings suggest that secrecy towards parents can have consequential health outcomes for youth with asthma and point to the importance of investigating affective processes as mediators of the influence of secret-keeping on youth health.

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1. Introduction

Asthma is the most prevalent childhood chronic illness in the United States, affecting primarily youth from minority and low-socioeconomic groups [1]. Asthma can influence developmental outcomes, increasing vulnerability for emotional and behavioral difficulties, which are exacerbated in youth facing socioeconomic adversity [2,3]. Research suggests that psychosocial stressors involving challenges in affiliating with others are associated with exacerbation of pediatric asthma symptoms and greater functional impairment [3]. For example, family conflict, youth oppositional behaviors, and difficulties in getting along with peers show robust associations with asthma severity, such as more frequent experiences of asthma attacks (e.g. Ref 2). Although these types of stressors represent clear manifestations of difficulties with interpersonal relationships, other subtler processes can also serve as important indicators of challenges in affiliating with others.

Among these, the tendency to keep secrets from close others is often an indicator of interpersonal stress stemming from lack of intimacy, and low trust. Although research shows that secrecy and lack of disclosure among youth can have deleterious consequences for psychological well-being, their effects on physical well-being are poorly understood. In an attempt to bridge this gap, we investigated the link between secrecy from parents regarding one's thoughts and activities, and physical health among low-income youth with asthma. We also tested negative affect as a plausible psychological mechanism that may underlie this association.

During late childhood and adolescence youth increasingly assert greater independence in their social environments. While building autonomy is an adaptive goal, maintaining cohesive and intimate relationships with parents leads to better psychosocial adjustment throughout adolescence [4]. Moreover, youths' disclosure to parents regarding various aspects of their daily lives is associated with fewer internalizing and externalizing problems [5,6]. Recent evidence, however, suggests that the effects of disclosure and secrecy towards parents are not mere opposites of each other [7]. Unlike failure to self-disclose, secrets involve active concealment of information and are part of normative information-sharing strategies that youth employ in order to increase autonomy [8].

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Indeed, many studies have shown that youth may choose to disclose certain information about their daily activities to parents, while keeping other information secret [8,9]. Despite their normative prevalence, secrets towards parents show consistent links with maladaptive outcomes [10]. Secrecy often appears as a marker for behavioral problems [11,12], and may also be connected to youth physical health problems. For example, secrecy regarding daily activities has been associated with more frequent physical complaints (e.g. headaches, nausea, 13) and research among youth with diabetes reveals that greater secrecy regarding diabetes management is associated with poorer adherence and glycemic control, independently from the effects of disclosure [14,15]. In contrast, youths' written disclosure of their innermost emotions is associated with reduced asthma symptoms and decreased functional disability [16].

Past research indicates that secrecy is also a strong predictor of psychological outcomes with prominent ties to physical health problems such as loneliness and depression [13,17]. Studies show that secrecy predicts increased negative affect longitudinally, with more frequent secret-keeping in early adolescence leading to increased depressive symptoms and anxiety over time, but not vice versa [10,18,19].¹ These findings have particular relevance for low-income youth with asthma for several reasons. First, psychological conditions that involve dysregulation of negative affect (e.g., depression) are frequently associated with increased symptoms and asthma severity [3], and these links are stronger among low-income youth [1,2]. Second, because of the many stressors that surround them, low-SES parents experience more parenting difficulties and tend to engage in more punitive parenting practices, which can alienate youth from warm and responsive interactions with them [20,21] and potentially increase secrecy in order to avoid punishment. Therefore, developing in economically distressed environments may exacerbate the secrecy-health link, particularly for conditions such as asthma. Although studies show that minority youth tend to be similar to European American youth in most aspects of secret-keeping behaviors [22], research in this area is limited [9] and further work is needed to better understand the health consequences of secret-keeping among youth in low-income settings.

Asthma shares a complex relation with sleep, a health behavior that may be significantly impacted by disclosure and secrecy [23,24]. Sleep is an important restorative behavior [25]. Research shows that asthma symptoms may lead to sleep disturbances [26,27], but also that poor sleep may influence subsequent asthma symptoms [28]. Negative affect and rumination may increase sleep difficulties, especially if experienced before bed-time [29,30]. Evidence also suggests that sleep is affected by social processes. For example, friendship quality was associated to sleep outcomes in college students [31,32], while greater attachment security to mothers predicted fewer sleep problems after two years among third grade children [33]. Such findings raise the possibility that the effects of secrecy among youth may extend to health outcomes and behaviors (e.g., sleep) relevant to asthma.

Generally, it is assumed that keeping secrets is an aversive process for the secret-keeper, since it requires increased monitoring and vigilance [34]. Active inhibition of one's thoughts and feelings may increase arousal, worry, and intrusive thoughts that may lead to increased experiences of stress over time [35]. Negative affect is often a consequence of stress and has been associated with poor physical health [36], including poor sleep outcomes [29], more frequent asthma symptoms and worse pulmonary functioning in youth with asthma [37]. Research with adolescents has shown that daily negative affect strongly predicts sleep disruptions and sleep quality [38,39]. Furthermore findings in adults suggest that negative affect may be a mechanism explaining the effects of self-disclosure processes on sleep [24]. Therefore, considering that secrecy may lead to exacerbation of negative affect over time, and that reductions in negative affect are associated with better sleep outcomes

[18,24], we expected that greater negative affect would mediate the links among secrecy, asthma symptoms, and sleep. Another line of reasoning, however, is that secret-keeping promotes vulnerability to negative health outcomes *only* among youth who experience higher levels of negative affect in daily life. In order to test these competing hypotheses, we examined negative affect both as a mediator and moderator of the association between secrecy and health outcomes.

Thus, in the current study, we investigated the links among secrecy regarding one's daily activities, thoughts, and feelings, asthma symptoms and sleep in an urban sample of youth with asthma. Given that secrecy might increase strain in parent-child relationships and isolate youth from warm and responsive interactions with parents, we hypothesized that higher levels of secrecy from parents would be related to more severe asthma symptoms. In line with the notion that secrecy promotes vigilance and rumination, we hypothesized that higher levels of secrecy would also be associated with several indicators of poor sleep. Because of the bidirectional association between asthma and sleep [40], we conducted exploratory analyses to test whether sleep outcomes would mediate the links between secrecy and asthma symptoms. Finally, because negative affect has been associated with both asthma morbidity and sleep problems, we tested the role of negative affect as a proximal mechanism of these associations.

2. Method

2.1. Participants

Participants were part of a larger longitudinal project examining the effects of family environments on childhood asthma.² Youths and their primary caregivers were recruited through Metro-Detroit area hospitals and schools. This study focused on baseline daily diary assessments collected from the youth participants. Families were eligible to participate if their child was between the ages of 10 and 17 with a diagnosis of mild to severe asthma confirmed by medical report. Families were excluded if youth were using oral steroid medication(s), diagnosed with a chronic condition other than asthma (e.g., endocrine disorders), or diagnosed with a medical condition that may interfere with immune system functions (e.g., pregnancy in the past year). The overall sample ($N = 194$) included 82 female ($Mean\ age = 13.03, SD = 1.88$) and 112 male ($Mean\ age = 12.62, SD = 1.75$) youths ranging in age from 10 to 17 years. The sample was reduced to 172 youths after excluding participants with >50% of missing data on study variables (see "Analysis Plan"). This final sample included 72 female ($Mean\ age = 13.07, SD = 1.94$) and 100 male ($Mean\ age = 12.63, SD = 1.77$) youths. One hundred and twenty nine (75.0%) youths were African American, with the rest being European American and Hispanic. Parental education ranged from *no schooling completed* to *doctoral degree*, with 40.1% of parents having completed at least 12 years of education. Annual parental income ranged from \$0–\$7825 tax bracket to the \$97,926–\$174,850 tax bracket with a median range of \$7826–\$31,850. Asthma severity diagnosis ranged from mild intermittent to severe, with 34.3% of participants having mild to moderate asthma, 34.3% having moderate to severe asthma and 31.4% of participants having severe asthma.

2.2. Procedure

Participants visited the lab to complete baseline questionnaires. Following this visit, youths completed daily diaries and sleep diaries in paper for two weekdays and two weekend days. Written assent and consent were obtained from the participating youth and their parent, respectively. Families were paid up to \$540 for their participation across

¹ The alternative hypothesis of negative affect leading to increased secrecy over time has been tested frequently but has not found strong support in the literature (e.g. [10,19]).

² Other papers from this project have investigated conflict and asthma symptoms [41], youth immune responses and affect [42], and youth positive behaviors and affect [43]. The present analyses do not overlap with these previous analyses.

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