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Retrospectively reported childhood adversity is associated with asthma and chronic bronchitis, independent of mental health

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ABSTRACT

Several researchers have raised the concern that the cross-sectional association of retrospectively reported childhood adversity with self-reported onset of asthma and chronic bronchitis in adulthood may be confounded, as well as mediated by an individual's mental health. The aim of this study was to assess the effect of retrospectively reported childhood adversity on self-reported onset of asthma and chronic bronchitis in adulthood, independent of potential confounding and mediating variables (including respondent's mental health). We used data collected in 2007–2008 within the framework of the Tromsø Study (N = 12,981), a representative study of adult men and women in Norway. The associations of childhood adversity with asthma and chronic bronchitis were assessed with Poisson regression models. Relative risks (RR) and 95% confidence intervals (CI) were estimated with bias-corrected bootstrapping. Childhood adversity was associated with a 9% increased risk of asthma (RR = 1.09, 95% CI: 1.02, 1.16) and a 14% increased risk chronic bronchitis (RR = 1.14, 95% CI: 1.03, 1.26) in adulthood, independent of age, sex, parental history of psychiatric problems/asthma/dementia, education, smoking, social support, and respondent's mental health. Controlling for indicators of respondent's mental health reduced the strength of associations of childhood adversity with asthma and chronic bronchitis; however, the associations were still present in the same direction ($p < .05$). These findings suggest that the association of retrospectively reported childhood adversity with asthma and chronic bronchitis is independent of respondent's mental health. We recommend controlling for indicators of the respondent's mental health to assess an unbiased association of retrospectively measured childhood adversity with self-reported asthma and chronic bronchitis.

What is already known on this subject?

- Association of childhood adversity with asthma and chronic bronchitis is over estimated due to differential recall bias, and confounding via mental health.
- Mental health mediates the association of childhood adversity with asthma and chronic bronchitis.

What this study adds?

- Childhood adversity is independently associated with an increased risk of asthma and chronic bronchitis.
- The association of retrospectively reported childhood adversity with asthma and chronic bronchitis is not driven entirely by respondent's mental health.

1. Introduction

Several population-based studies have shown that childhood adversity is associated with an increased risk of stress-related physical health outcomes, such as asthma and chronic bronchitis later in life [1–8]. The role of mental health in the association of childhood adversity with onset of asthma and chronic bronchitis has been hypothesized in two ways: (1) mediation, whereby childhood adversity is associated with an increased risk of mental health problems, which in turn are associated with an increased risk of asthma and chronic bronchitis [8] (Fig. 1a); and (2) confounding and differential recall bias, i.e., psychological state of respondents at the time of reporting childhood adversity [7] may confound the association of retrospective childhood adversity with self-reported asthma and chronic bronchitis [1] (Fig. 1b). When considering the mediation hypothesis, childhood adversity can certainly affect mental health [8,9], while simultaneously affecting onset of asthma and chronic bronchitis via psychogenic relationships [1,3,7,8,10–12]. Mental health problems may also affect the

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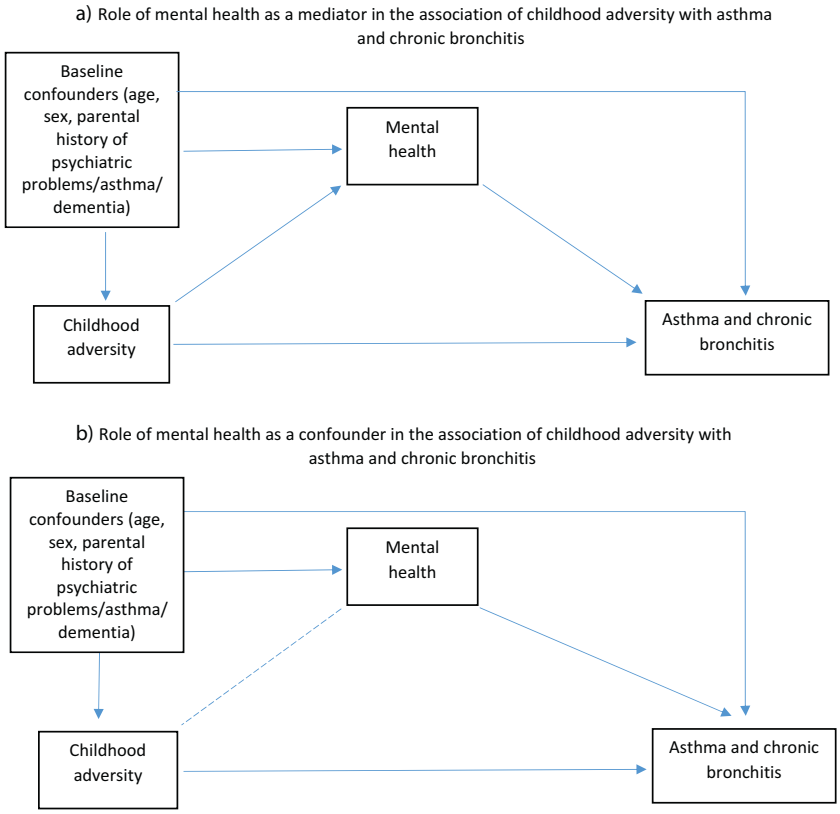

Fig. 1. Role of mental health as a mediator (a) and confounder (b) in the association of childhood adversity with asthma and chronic bronchitis.

experience of asthma and adherence to treatment and hospitalization rates [13–15]. Previous evidence has suggested that almost half of all cases of psychiatric disorders manifest by age 14 years and three-fourths by age 24 years [16] [see also [17]]. This could imply that mental health in adulthood represents a continuation or a recurrence of childhood or adolescent mental health. Accordingly, mental health may mediate the association of childhood adversity with asthma and chronic bronchitis, even if it is measured in adulthood [8]. The association of childhood adversity with a wide range of psychiatric disorders is well-established [4,8,18–24]. In turn, several previous studies have shown that poor mental health is associated (directly or indirectly) with an increased risk of asthma and chronic bronchitis [5,11,25–31], and that indicators of mental health mediate the association of childhood adversity with asthma and chronic bronchitis [1,5,8,11,25].

Regarding the second explanation (confounding and differential recall bias), several researchers have raised the concern that the observed association of retrospectively reported childhood adversity with asthma and chronic bronchitis could be an artefactual correlation driven by the current psychological state of the respondent via anchoring effect, affective states, deficits in memory functioning, mood-congruency bias, and biased autobiographical memory [7,32–53]. Individuals with mental and physical health problems could be more likely to report childhood adversity [1,7]. Indeed, even twins or siblings may recall and perceive their financial and psychosocial circumstances in childhood differently [54–58]. If current psychological state confounds the association of retrospectively-measured childhood adversity with asthma and chronic bronchitis, the relationship of childhood adversity with asthma and chronic bronchitis may flow through the mechanism of memory retrieval and attribution from the adult to childhood years [7]. For instance, asthma or chronic bronchitis cases may assign more significance to past events by over-reporting childhood adversity in an attempt to search for explanations and to make sense of their current health [1,7]. Generally, these criticisms are based on the hypothesis that self-reported childhood adversity and self-reported health are not entirely distinct "things" if the correlation between them is driven by subjectivity and differential measurement error, which can lead to spurious correlations between them [7]. For this reason, it is necessary to know whether the association of childhood adversity with asthma and chronic bronchitis is free from biases related to current mental health [1,7,59].

The association of retrospectively-measured childhood adversity with asthma and chronic bronchitis is unique in the sense that it is impossible to separate the mediating and confounding mechanisms of mental health. The statistical approach [difference-in-coefficients method [60]] to estimate the effect of childhood adversity on asthma and chronic bronchitis, independent of respondent's mental health is exactly the same whether respondent's mental health is hypothesized as a mediator or as a confounder [7,60–62]. Estimation of "direct effect" is not appropriate in this setting, because the term implies the effect of an exposure on an outcome that is not mediated via specific mediator(s) [60], and it does not take into account the potential confounding and recall bias by some *hypothesized* mediating variables, such as indicators of mood state. Similarly, the estimation of "indirect effect" [difference between total effect and direct effect [60]] is not meaningful in this setting, because the estimate of childhood adversity may be attenuated by controlling for indicators of mental health not only due to mediation, but also because of potential confounding by respondent's mental health. Therefore, the "independence hypothesis" [7] may be more meaningful, as it tests whether childhood adversity is associated with asthma and chronic bronchitis, *independent* of potential confounders and respondent's mental health. In addition, the *independence* hypothesis ignores the distinction between a mediator and a confounder [7]; instead, it focuses on the influence of childhood adversity on asthma and chronic bronchitis that is neither mediated nor confounded by respondent's mental health.

In this study, we used a wide range of indicators of mental health,