

Caregiver Beliefs in the Overemphasis of the Education System on Academic Performance as an Etiology of Attention-deficit/Hyperactivity Disorder

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Abstract

Objectives: Caregiver beliefs about the causes of attention-deficit/hyperactivity disorder (ADHD) may influence caregiver intentions to let children with ADHD receive treatment. In this survey study, we intended to determine the proportion of caregivers who attribute the overemphasis of the education system on child academic performance as the etiology of their children's ADHD and the factors related to this attribution. **Methods:** In total, 213 caregivers of children with ADHD participated in this study and were asked whether they regarded the overemphasis of the education system on child academic performance as the etiology of their children's ADHD. Affiliate stigma was assessed using the Affiliate Stigma Scale. Each caregiver rated their child's ADHD and oppositional defiant disorder symptoms using the short Chinese version of the Swanson, Nolan, and Pelham, Version IV Scale. The depression and anxiety of the caregivers were assessed using the Beck Depression Inventory and Beck Anxiety Inventory, respectively. **Results:** The results were found that 58 (27.2%) caregivers regarded the overemphasis of the education system on child academic performance to be the etiology of their children's ADHD. Affiliate stigma of caregivers was significantly associated with caregiver attribution ($p < 0.05$). Caregiver depression ($p < 0.01$) and anxiety ($p < 0.01$) were significantly associated with caregiver attribution of the etiology of ADHD in bivariate logistic regression analysis models; the associations became nonsignificant after the effect of affiliate stigma being considered. **Conclusion:** Health professionals should consider caregiver-attributed etiologies when they are developing intervention programs for enhancing the mental health of caregivers and their children with ADHD.

Key words: affiliate stigma, anxiety, depression, psychological well-being
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Introduction

Attention-deficit/hyperactivity disorder (ADHD) is the most prevalent childhood-onset neurodevelopmental disorder. It affects 10.1% of school-age children and adolescents [1]. Children with ADHD may exhibit symptoms such as aggressive behavior, learning difficulties, rule breaking, low motivation, and an inability to delay gratification; they are also susceptible to depression, substance abuse, interpersonal difficulties, family disruptions, academic and occupational underachievement, as well as suicide and risk-taking behaviors [2]. But ADHD is underdiagnosed and undertreated in Taiwan [3]. Given that

children strongly rely on their caregivers to make treatment-related decisions on their behalf [4], researchers should clarify the factors that may influence the help-seeking behaviors of caregivers in the context of their children's ADHD.

According to the Theory of Attribution [5], the beliefs of caregivers regarding the cause of a disorder determine how

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they react to their children's disorder [6]. Therefore, caregiver beliefs about etiology may affect when caregivers bring their children to seek the help of medical professionals [7], influence their decisions on the types of treatments that they choose for their children [8, 9], and contribute to their children's health outcomes [6]. Parents may attribute their children's ADHD to various causes, such as diet (e.g., sugar consumption), poor discipline, and genetics [7, 10, 11]. Studies indicated that caregivers are more likely to use medication to treat their children's ADHD when they believe that their children's ADHD has physical causes; conversely, they are less likely to use medication when they believe that their children's ADHD has sociological causes [12, 13]. Therefore, understanding caregiver beliefs about the etiologies of child ADHD can contribute to the development of strategies for enhancing caregiver acceptance of ADHD diagnosis and treatment.

A study revealed that some caregivers attribute their children's ADHD to the overemphasis of the education system on academic performance [13]. Children with ADHD often have difficulties focusing in a classroom setting and completing their homework on time; they may also score poorly on tests because of their carelessness and tendency to give up. Therefore, children with ADHD encounter various difficulties in societies that emphasize academic achievement. Credentialism is the main focus of the education system in Taiwan. The traditional teaching method in Taiwan is one-way teaching, where the teacher teaches from a podium and the students sit in their seats and listen. Although this method of teaching ensures that teachers are in control of the progress of the lessons, students need to be highly attentive to follow the lessons, which sometimes poses a challenge to students who have the difficulty in concentrating [14]. Because teacher observations of children's behaviors in a classroom setting are a basis for diagnosing ADHD, caregivers who attribute their children's ADHD to an education system's overemphasis on academic performance may question the reliability of these observations. Accordingly, caregivers may also doubt their children's ADHD diagnosis and the necessity of treating this condition.

Identifying the factors that influence caregiver attribution of the etiology of their children's ADHD can facilitate the development of intervention programs. According to ecological systems theory [15], many factors can contribute to caregiver beliefs about the etiologies of children with ADHD, including caregiver-related factors, child-related factors, and child-caregiver environmental factors. Regarding caregiver-related factors, a study reported that fathers attributed their children's ADHD to external causes (e.g., environmental stressors) to a greater degree relative to mothers [16]. Caregivers with a higher socioeconomic status are also more likely to attribute their children's ADHD to genetic causes [7]. With regard to child-related factors, caregivers of girls have been reported to be more likely than caregivers of boys to believe that ADHD is caused by stressful life events and less likely to believe that ADHD is caused by genetic factors [7]. The associations of various caregiver-related (e.g., age) and child-

related factors (e.g., ADHD and oppositional defiant disorder [ODD] symptoms) with caregiver attribution of the etiology of ADHD should be further studied. Furthermore, whether caregiver depression and anxiety are related to the attribution should also be clarified. For child-caregiver environmental factors, caregivers of people with mental illness may perceive and internalize public stigma toward those with mental illness [17]. A study reported that caregiver affiliate stigma is associated with the attribution of ADHD to nonbiological causes [13]. The association between affiliate stigma and the caregivers attributing the etiology of their children's ADHD to the overemphasis of the education system on academic performance should be further studied.

In this cross-sectional study, we intended to determine the proportion of caregivers who attributed the overemphasis of the education system on child academic performance as the etiology of their children's ADHD and to identify the factors that influence this attribution. We hypothesized that being a male caregiver, having a low educational level, having caregiver affiliate stigma, having great depressive and anxiety symptoms, having a girl with ADHD, and having child ADHD and ODD symptoms would be significantly associated with caregiver attribution of the overemphasis of the education system on child academic performance as the etiology of their children's ADHD.

Methods

Study participants

The present study recruited participants from three child and adolescent psychiatric clinics based in two general hospitals in southern Taiwan. Individuals were eligible for inclusion in the present study if they were the primary caregiver of a child aged between 10 and 18 years who was diagnosed with ADHD using the criteria outlined in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* [18]. Two exclusion criteria were applied. First, caregivers were excluded if they had schizophrenia spectrum disorders, intellectual disabilities, substance use disorders, or other physical and psychiatric disorders that could affect their ability to understand the present study's purpose and procedures. Second, caregivers of children with comorbid intellectual disabilities and autism spectrum disorder, bipolar spectrum disorders, or schizophrenia spectrum and other psychotic disorders were also excluded.

In this study, we recruited caregivers of children with ADHD who had visited outpatient clinics between June 2018 and May 2021. After evaluating 220 potential participants, three child psychiatrists confirmed the eligibility of 213 caregivers (168 women and 45 men) on the basis of the inclusion and exclusion criteria. The participants were provided with copies of self-reported questionnaire and were instructed how to fill it out, after which they completed the self-report questionnaires in individual research rooms. The present study was approved by the institutional review boards of two hospitals: Chang Gung Medical Foundation (IRB protocol number = 201800740A3 and date of approval = May 18, 2018) as well as Kaohsiung Medical University Hospital

(IRB protocol number = KMHIRB-SV (II)-20170077, date of approval = June 26, 2017) with the requirement to obtain informed consent from all study participants.

Measures

Caregiver-attributed etiologies of attention-deficit/hyperactivity disorder

To assess whether a participant attributed the overemphasis of the education system on academic performance as the etiology of their children's ADHD, we asked the following question: "Do you think that the education system's overemphasis on the academic performance of students is the reason why students are diagnosed with ADHD?" A participant could answer this question with a "yes" or "no" response.

Chinese version of Swanson, Nolan, and Pelham, Version IV Scale

The short Chinese version [19] of the Swanson, Nolan, and Pelham, Version IV Scale [20] was used to assess the caregiver-reported severity of the ADHD and ODD symptoms exhibited in the preceding month by the children under the participants' care. This version of the scale comprises 26 items that encompass the core *DSM*-derived ADHD and ODD symptoms. Each item is rated on a four-point Likert scale with endpoints ranging from 0 (symptom being absent) to 3 (symptom being severe). In the present study, the Cronbach's α values for inattention, hyperactivity and impulsivity, and oppositional behavior were 0.88, 0.89, and 0.91, respectively.

Affiliate Stigma Scale

The Affiliate Stigma Scale (ASS) is a self-rated 22-item questionnaire that measures caregivers' internalization of stigma toward their family member's mental illness [17]. We focused on the affiliate stigma of caregivers toward their children's ADHD. The participants rated their level of agreement with each statement in the ASS on a four-point Likert scale with endpoints ranging from 1 (strongly disagree) to 4 (strongly agree). A higher total score on the ASS indicates that a caregiver exhibits a greater level of affiliate stigma toward their children's ADHD and toward themselves. The original version of the ASS was demonstrated to have excellent internal consistency ($\alpha = 0.94$) and satisfactory predictive validity [17]. It was also demonstrated to be a robust psychometric measure for Taiwanese populations [21]. In the present study, the Cronbach's α value for the ASS was 0.92.

Caregiver and child demographics

Information regarding the sex and age of the caregivers, the sex and age of the children under their care, and the caregivers' years of education was collected.

Statistical analysis

Research assistants in the present study explained to each participant the procedures and methods for completing copies of the questionnaire. The participants could request the research assistants to resolve any problems pertaining to the completion of copies of the questionnaire. We calculated the proportion of caregivers that attributed their children's ADHD

to the overemphasis of the education system on academic performance.

In this study, we first detected the associations of caregiver-related factors (sex, age, years of education, depression, and anxiety), child-related factors (sex, age, and ADHD and ODD symptoms), and child-caregiver environmental factors (caregiver affiliate stigma) in two stages. In the first stage, the bivariate logistic regression analysis involved the entry of only one independent variate for each time to detect their associations with caregivers' attribution of the ADHD etiology. In the second stage, factors that were significantly associated with caregivers' attribution of the ADHD etiology in the bivariate logistic regression analysis models were further included in a multivariate logistic regression model to identify their associations with caregivers' attribution of the ADHD etiology.

The study variables were computed using the Statistical Package for the Social Science software version 22.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The differences between groups expressed in odds ratio and 95% confidence interval were considered significant if two-tailed p values were smaller than 0.05.

Results

Table 1 presents the proportion of caregivers who attributed the overemphasis of the education system on child academic performance as the etiology of their children's ADHD, the

Table 1. Caregiver-related and child-related factors and parenting stress ($N = 213$)

	<i>n</i> (%)	Mean \pm SD
Attributing the overemphasis of the education system on academic performance as the etiology of ADHD		
No	155 (72.8)	
Yes	58 (27.2)	
Caregiver factors		
Sex		
Male	45 (21.1)	
Female	168 (78.9)	
Age (years)		44.63 \pm 6.11
Years of education completed (years)		14.15 \pm 3.02
Depression on the BDI		9.65 \pm 8.56
Anxiety on the BAI		8.07 \pm 9.43
Child factors		
Sex		
Boy	181 (85.0)	
Girl	32 (15.0)	
Age (years)		12.88 \pm 2.15
Inattention		76.64 \pm 22.27
Hyperactivity/impulsivity		72.32 \pm 23.24
Oppositional defiance		70.71 \pm 26.21
Child-caregiver environmental factor		
Affiliate stigma on the ASS		37.84 \pm 10.78

ADHD, attention-deficit/hyperactivity disorder; ASS, Affiliate Stigma Scale; BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory

Table 2. Factors related to caregivers' attribution of overemphasis of education system on child academic performance as etiology of attention-deficit/hyperactivity disorder: a bivariate logistic regression analysis

	Attribution, OR (95% CI)
Caregivers' sex	0.607 (0.272–1.355)
Caregiver's age	0.986 (0.937–1.037)
Caregiver's years of education completed	1.094 (0.989–1.211)
Caregivers' depression	1.057 (1.021–1.095)**
Caregivers' anxiety	1.049 (1.017–1.083)**
Children's sex	0.949 (0.411–2.192)
Children's age	0.996 (0.865–1.147)
Children's inattention	0.983 (0.933–1.035)
Children's hyperactivity/impulsivity	0.989 (0.939–1.042)
Children's oppositional defiance	1.015 (0.966–1.067)
Caregivers' affiliate stigma	1.051 (1.021–1.082)*

* $p < 0.05$; ** $p < 0.01$

OR, odd ratio; CI, confidence interval

Table 3. Factors related to caregivers' attribution of overemphasis of education system on child academic performance as etiology of attention-deficit/hyperactivity disorder: a multivariate logistic regression analysis

	Attribution, aOR (95% CI)
Caregivers' affiliate stigma	1.038 (1.006–1.071)*
Caregivers' depression	1.019 (0.972–1.067)
Caregivers' anxiety	1.028 (0.988–1.071)

* $p < 0.05$

aOR, adjusted odd ratio; CI, confidence interval

Table 4. Associations among affiliate stigma, caregiver depression and anxiety, and caregiver attribution of attention-deficit/hyperactivity disorder etiology: pathway analyses

	B	SE	Z
Affiliate stigma → Depression	0.311	0.054	5.766***
Affiliate stigma → Anxiety	0.239	0.070	3.428***
Affiliate stigma → Caregiver attribution	0.007	0.003	2.096*
Depression → Caregiver attribution	0.004	0.004	0.977
Anxiety → Caregiver attribution	0.006	0.005	1.776

* $p < 0.05$; $p < 0.01$; *** $p < 0.001$

SE, standard error

demographic characteristics of the participants, and the results pertaining to affiliate stigma, ADHD and oppositional symptoms, and caregiver depression and anxiety. In total, 27.2% of the participants attributed the overemphasis of the education system on child academic performance as the etiology of their children's ADHD.

Table 2 presents the bivariate logistic regression results for the factors related to caregiver attribution of the etiology of child ADHD. Caregiver affiliate stigma ($p < 0.05$), depression ($p < 0.01$), and anxiety ($p < 0.01$) were

significantly associated with caregiver attribution of the overemphasis of the education system on child academic performance as the etiology of their children's ADHD. Caregiver and child demographics and child ADHD and ODD symptoms were not significantly associated with the aforementioned attribution.

Caregiver affiliate stigma, depression, and anxiety were further included in a multivariate logistic regression model to identify their associations with caregivers' attribution of the ADHD etiology (Table 3). Only caregiver affiliate stigma but not depression or anxiety was significantly associated with the aforementioned attribution ($p < 0.05$).

The mediating effects of caregiver depression and anxiety on the association between affiliate stigma and caregivers' attribution of the ADHD etiology were further examined by using pathway analyses (Table 4). The results revealed that affiliate stigma was significantly associated with caregiver depression ($p < 0.001$), anxiety ($p = 0.001$), and attribution of ADHD etiology ($p < 0.05$). The associations of caregiver depression and anxiety with the attribution of ADHD etiology were not significant, indicating that caregiver depression and anxiety did not mediate the association between affiliate stigma and caregivers' attribution of the ADHD etiology.

Discussion

In the present study (Table 1), more than a quarter (27.2%) of the participants attributed their children's ADHD to the overemphasis of the education system on child academic performance. Caregiver affiliate stigma ($p < 0.05$), depression ($p < 0.01$), and anxiety ($p < 0.01$) were significantly associated with caregiver attribution of the etiology of ADHD in bivariate logistic regression analysis models (Table 2), whereas only caregiver affiliate stigma ($p < 0.05$) was significantly associated with caregiver attribution of the etiology of ADHD in the multivariate logistic regression analysis model.

Although the participants in the present study were caring for children who visited psychiatric outpatient clinics, more than a quarter (27.2%) of the participants attributed their children's ADHD to the overemphasis of the education system on their child's academic performance (Table 1). The education system in Taiwan is strongly influenced by ideas in Confucianism, which eschews play and emphasizes hard work, effort, persistence, self-cultivation, and discipline in one's studies [22]. Consequently, credentials are valued in Taiwanese society. But the core symptoms of ADHD adversely affect a child's ability to perform academically. Attributing a child's ADHD to the overemphasis of the education system on child academic performance may hinder cooperation between caregivers and school staff and further exacerbate the care burden and psychological strain on caregivers. Researchers have also demonstrated that caregiver-attributed ADHD etiologies predict the treatment choices of caregivers [23]. Caregivers who attribute the etiology of their children's ADHD to the overemphasis of the education system on child academic

performance may be less likely to seek treatment for their children's ADHD.

In the present study (Table 2), we found that affiliate stigma ($p < 0.05$) was significantly associated with caregiver attribution of the overemphasis of the education system on academic achievement as the etiology of ADHD. The affiliate stigma in caregivers of people with mental illness develops through the perception and internalization of public stigma toward caregivers [17]. The attribution of ADHD to the overemphasis of the education system on academic achievement may reduce caregiver affiliate stigma and serve as a mechanism for protecting the dignity of caregivers. But caregivers who attribute ADHD to nonbiological etiologies may delay medication treatment for their children's ADHD. This results in a vicious cycle where delayed treatment results in worsened symptoms, which in turn worsens public prejudice, increases affiliate stigma, and, consequently, leads to the further delay of treatment.

The result of bivariate logistic regression analysis models revealed that depression ($p < 0.01$) and anxiety ($p < 0.01$) were significantly associated with caregiver attribution of the overemphasis of the education system on academic achievement as the etiology of ADHD (Table 2), although the associations became nonsignificant in the multivariate logistic regression analysis model (Table 3). No mediating effects of caregiver depression and anxiety on the association between affiliate stigma and caregiver attribution were found (Table 4). Mental health problems are prevalent among caregivers of children with ADHD [24]. Although the cross-sectional study design limited the inference of temporal relationships between caregiver attribution and mental health problems, there may be reciprocal relationships between them. First, caregivers who attribute their children's ADHD to the overemphasis of the education system on academic achievement may be less likely to let their child undergo effective ADHD treatment and less likely to cooperate with schoolteachers to improve their children's learning. Both untreated ADHD and learning difficulties can exacerbate the care burden and mental health problems of caregivers of children with ADHD. Alternatively, depression and anxiety may lead to caregivers' difficulty in accepting the explanations of health professionals regarding the biological etiology of ADHD. Furthermore, both mental health problems and the attribution of the overemphasis of the education system on academic achievement as the etiology of ADHD can result from caregiver perception of the public stigma toward ADHD. To help caregivers and their children with ADHD, the early detection and management of caregiver depression and anxiety are crucial. In the present study, caregiver affiliate stigma was not significantly associated with depression or anxiety.

This study (Table 1) was found that caregiver demographics and child ADHD and ODD symptoms were not significantly associated with caregiver attribution of the overemphasis of the education system on academic achievements as the etiology of ADHD. The results of this study are not consistent with those of previous studies. Previous studies showed that caregiver

sex [16], socioeconomic status [7], and child sex [7] are related to caregiver belief in nonbiological etiologies of ADHD. The caregivers participating in this study were recruited from outpatient clinics; they might have received the information regarding the etiology of ADHD from medical professionals and had a degree of acceptance of the biological causes of ADHD. Moreover, they might have been persuaded by the effects of pharmacological treatment on their child's ADHD and ODD symptoms. This study did not find the significant influences of caregiver and child demographic characteristics and child ADHD and ODD symptoms on caregiver belief in the overemphasis of the education system on child academic performance as the etiology of their children's ADHD. But further studies are required to replicate the results of the present study.

Study limitations

The readers are warned not to overinterpret the study findings because our study has four limitations:

- Our adoption of cross-sectional research design limited our ability to verify the causal relationship between the attribution of the etiology of ADHD and various related factors.
- Our data were collected only through caregiver self-reports. Thus, our results could be affected by common method variance.
- We did not examine the influence of ADHD information sources on the attribution of the etiology of ADHD.
- In the present study, we recruited caregivers of children with ADHD exclusively from outpatient clinics, which limits the generalizability of the findings to caregivers who do not seek care from child psychiatrists.

Summary

In the present study, more than a quarter of caregivers of children with ADHD attributed their children's ADHD to the overemphasis of the education system on academic achievement. Thus, health professionals should evaluate caregiver attribution of the etiology of ADHD, enhance their understanding of the etiologies of ADHD, and work with caregivers to treat children with ADHD. Caregiver affiliate stigma was related to the attribution of the overemphasis of the education system on academic achievement as the etiology of ADHD. Therefore, health professionals should take affiliate stigma into consideration when they work with caregivers to develop treatment plans for children with ADHD. The attribution of the overemphasis of the education system on academic achievement as the etiology of ADHD was significantly associated with caregiver depression and anxiety. Thus, health professionals should routinely assess the mental health status of caregivers of children with ADHD.

Data Availability Statement

The study data are available upon reasonable request to the corresponding authors.

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Conflicts of Interest

C. F. Yen is a domestic advisory board member of the *Taiwanese Journal of Psychiatry* (Taipei). He did not participate in peer review of this manuscript, or made any decision in accepting this manuscript to publish. The authors declare no conflicts of interest.

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