



# Understanding parental causal explanations and help seeking in attention-deficit/ hyperactivity disorder: perspectives from a developing Asian nation



Ruchita Shah\*, Akhilesh Sharma, Nidhi Chauhan, Soumya Jhanda, Sandeep Grover

Department of Psychiatry, Postgraduate Institute of Medical Education and Research, Chandigarh, India

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## ABSTRACT

**Introduction:** Research on parental understanding of causation and help-seeking for ADHD comes from ethnic minorities in developed nations; research from Asia is scarce. Our purpose was to explore perceptions of Indian parents regarding causation and diagnosis of problematic childhood behaviors diagnosed as ADHD or hyperkinetic disorder, and to understand the process of decision making and help seeking using a qualitative study design.

**Method:** In-depth, semi-structured interviews were conducted with 52 parents (33 mothers and 19 fathers), focusing on initial emotional reactions and cognitive appraisals, decision making, parental causal explanations and perceptions regarding diagnosis and symptom labeling.

**Results:** Mothers were decision makers for seeking professional help either singly or jointly in 76.1% of cases. Initial reactions ranged from those with negative valence (negative emotional reactions and cognitive appraisals) to ambi-valence (recognition of problems, but at the same time not accepting completely) and positive valence (sense of relief and hopefulness). Psycho-social explanations (63.46%) were more common than biological explanations (51.82%), with 19.23% reporting both explanations. Biological explanations included illness model (e.g. brain problem, obstetric complications), hereditary and intellectual disability. Psycho-social explanations included psychological (e.g. lack of motivation) and social (e.g. problems with disciplining at home) causations. Irrespective of initial reactions and causal explanations, a significant majority of parents were aware of the diagnosis and labeled problems as symptoms attributable to ADHD.

**Conclusion:** Our findings provide insights for development of culturally sensitive psycho-social interventions; from understanding of causal attributions, process of decision making and help seeking.

## 1. Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a chronic, pervasive condition characterized by developmentally inappropriate inattention, impulsivity and hyperactivity. It is one of the most common childhood disorders, affecting around 5%–7% of children worldwide (Polanczyk et al., 2007; Willcutt, 2012) and is associated with significant impairment in daily activities, academic performance, peer relations, and family and social functioning. The disorder runs a chronic course with as many as 65% of affected individuals showing significant symptoms and impairments during adolescence and adulthood (Faraone et al., 2006), and it is a risk factor for other mental disorders and negative outcomes including substance use and criminality in the long term. Moreover, there is enough evidence to show that without treatment, individuals with ADHD have poorer long-term outcomes with impairments in multiple domains when compared to peers without

ADHD, and treatment improves long-term outcomes compared with untreated ADHD (Doshi et al., 2012; Shaw et al., 2012). However, only a minority access specialist mental health services, even in developed nations (Bussing et al., 2003; Fridman et al., 2017; Sayal et al., 2002, 2010) and there is a significant time lag till consultation in developing nations (Anand et al., 2018; Arya et al., 2015). Though the research in ADHD is limited (Anand et al., 2018; Arya et al., 2015), recent studies from the Asian sub-continent indicate that there are significant delays in help seeking in other neuro-developmental disorders such as autism spectrum disorders, intellectual disability and specific learning disorders as well, despite evidence that early intervention can improve outcomes (Chakraborty et al., 2014; Preeti et al., 2017).

Culturally contextualized individual health beliefs and understanding of causation and treatment of ADHD and help seeking behaviors (Bussing et al., 1998, 2003; Bussing et al., 2005; Sayal et al., 2002; Hillemeier et al., 2007; Lawton, 2009; Waite and Tran, 2010) have been

\* Corresponding author.

E-mail address: [drruchitashah@gmail.com](mailto:drruchitashah@gmail.com) (R. Shah).

identified as one of the major reasons for the service under-utilization and influence the pathways to care (Wright et al., 2015). For a child or adolescent, whether he receives treatment will largely depend upon the significant adults in his life, i.e. parents and their beliefs and perceptions about the disorder and the treatment (Reardon et al., 2017). This important area has been grossly under-studied in the Asian context (Anand et al., 2018; Arya et al., 2015; Wilcox et al., 2007) with only one study directly exploring the parental causal explanations (Wilcox et al., 2007). Owing to the direct clinical implications of the issue, we aimed to explore perceptions of Indian parents regarding causation and diagnosis of problematic childhood behaviors diagnosed as ADHD. Further, we attempted to understand the process of decision making and help seeking by exploring the cognitive states of parents over time, which has not yet been studied for ADHD.

**2. Material and methods**

The study adopted a qualitative design and was conducted in the Department of Psychiatry of a Governmental post-graduate teaching hospital in north India. Study sample was drawn by purposive sampling from the parents of children and adolescents aged 5–18 years who had received a clinical diagnosis of either hyperkinetic disorder according to ICD-10 (World Health Organization, 1992) or attention-deficit/ hyperactivity disorder according to DSM 5 (American Psychiatric Association, 2013) made by an experienced consultant psychiatrist and meeting the inclusion and exclusion criteria. Parent of either gender, residing with the child and who was willing to participate and gave written informed consent was included. Parents known to have intellectual disability or any severe current mental or physical illness precluding them from participation were excluded. Ethical clearance was obtained from the Institute Ethics Committee and strict data confidentiality was maintained.

**2.1. Instruments**

- 1 Family structure and organisation: Details regarding type of family, primary caregiver for the child and decision maker in the family were recorded.
- 2 Semi-structured interview for assessing causal models and perceptions regarding diagnosis and treatment was developed. It was decided to trace the process of help seeking, through progression of emotional and cognitive states and causal attributions leading to acceptance of professional help. The interview questions under different sections were reviewed by an independent panel of three experts, including psychiatrists and a psychologist. It was found to have adequate face validity. The interview had following components (See Table 1 for the part of the semi-structured interview, data pertaining to which has been presented in the index paper):

- a
  - a Main perceived problems (i.e. presenting complaints) at the time of first contact
  - b First reaction in terms of thoughts, emotions and behaviour when child was referred by a teacher or physician or a relative in cases when parent had not brought the child on their own.
  - c Explanatory models of causation of child’s problems based on Kleinman’s model (Kleinman, 1980), explanatory models as described by Weiss and Somma (2007), and findings from Wilcox et al. (2007).
  - d Perceptions regarding diagnosis and symptom labelling.

All consenting parents were interviewed to collect data on socio-demographics, family structure and organization and the semi-structured interview.

**Table 1**  
Semi-structured Interview to assess causal explanations and process of help seeking.

Semi-structured Interview to assess causal explanations and process of help seeking	
<i>Main perceived problems (i.e. presenting complaints) at the time of first contact</i>	
What were the main problems for which you sought help from any doctor for the first time?	
<i>First reaction to referral</i>	
1 Who suggested that you should seek consultation for your child?	
2 How did you feel when he/she suggested so?	
3 What ran through your mind when he/she suggested so?	
After eliciting the reactions,	
4 “What happened after that?”	
5 “Who amongst you in the family decided to take him/ her to the doctor?”	
<i>Explanatory models of causation of child’s problems</i>	
“What do you think has caused these problems (hyperactivity, academic problems, etc.)?” We would like to know what you think/ have always thought is the cause, and not what you might have been told by doctors or teachers.	
“What else do you think might have caused these problems?”	
Attempt to elicit as many responses as possible.	
Follow –up questions for each perceived cause that is reported:	
“Can you explain it to me?”, “Can you tell me more about it?”	
<i>Perceptions regarding diagnosis and symptom labelling</i>	
1 Do you know the diagnosis of your child? If yes,	
2 “What does this diagnosis mean to you?”	
3 “Did anyone tell you what your child is suffering from or did you find out the diagnosis by yourself? In the former, the follow up question is “by whom?, and in the latter, “How did you find out?”	
4 “Do you agree with the diagnosis?”	
5 “Do you think your child’s problems are attributable to this diagnosis?”	
6 Parents who reported that they did not know the diagnosis were asked, “Can your child’s difficulties be due to a brain problem?”	

**2.2. Statistical analysis**

Data were organized into the broad categories of demographics, family structure and organization, initial reactions to referral, causal attributions and explanatory models, and name and manifestations of the disorder. Under these categories, recurring themes were identified by the authors independently and thereafter together. After data were organized into categories, emergent themes were analyzed by the authors. Further relations of initial reactions with categories of causal attributions were also analysed.

**3. Results**

Fifty-two parents (33 mothers and 19 fathers) of 46 children participated in the study. See Table 2 for socio-demographics, family structure and organisation. Eleven children had borderline intelligence or intellectual disability and 4 out of 46 had conduct disorder or oppositional disorder.

The sources of referral were teachers (n = 18, 39.1%), paediatricians and other medical agencies (n = 14, 30.4%) followed by

**Table 2**  
Socio-demographic characteristics of participating parents (n = 52).

	Mean (SD)	Frequency (%)
Mean years of schooling of parents (n = 52)	14.34 (3.95)	–
Mother’s Occupation (n = 33)		
Homemakers	–	75.75%
Paid employment	–	24.24%
Father’s Occupation (n = 19)		
Semi skilled/ skilled work	–	36.8%
Clerical	–	15.8%
Semi professional/ professional	–	47.36%
Type of family (n = 46)		
Nuclear		63.5 %
Joint/ Extended		34.6 %

parents themselves (n = 10, 21.7%), and other relatives (n = 4, 8.7%). Presenting complaints reported were excessive activity and energy, restless/ does not sit still, excessively naughty, does not obey or follow instructions, frequent fights with other children, frequent complaints from school, temper tantrums, forgetfulness, not motivated, learning problems and poor academic performance. Reasons for referral were both disciplinary/ behavioral problems and scholastic difficulties in a majority (n = 25, 54.35%) followed by only disciplinary/ behavioral problems in 32.65% (n = 15) and only scholastic problems in 13% (n = 6). Parents did not differ in reporting presenting problems in case of the 6 children where both parents had participated. Out of the 46 children, the decision to seek professional advice for the index child was taken by mothers in a majority of cases (n = 24, 52.2%), followed by both parents, and fathers alone (n = 11, 23.9% each). In other words, mothers played a key role in taking decision related to professional help seeking in 76.1% of cases.

### 3.1. Initial reaction when referred

Data pertaining to the initial reactions of the parents other than those twelve (8 parents and 2 couples) where the referral was self-initiated could be organised into three dominant themes; namely, negative valence, ambi-valence and positive valence. Themes with negative valence were those which were characterized by negative emotional reactions and cognitive appraisals and reflected denial or minimization of problems. For example, one father reported, “I was quite upset, rather angry when she (teacher) told me to take him to a psychiatrist. The first time she told, I told her on her face, that just because the school is not able to help him with his studies, that does not mean he is mad. There were a few complaints from the previous class teacher, but nobody had suggested seeing a psychiatrist ever before..... Just because he is a little naughty, so many children are (naughty), so what?” (See Table 3). The affective component was reflected in feelings of confusion, anger and surprise. Parents either minimized or normalised their child’s problems and their thinking reflected stigmatizing stereotype attached to psychiatric consultation, the latter being equated to being mad. Some parents either additionally (10%) or solely (15%) reported anxiety and worry. These parents represented the ambi-valent theme, characterized by anxiety and worry that reflected recognition of problems to some extent, but at the same time being not so sure. For example, a mother said, “I started wondering what are my child’s behaviors if not just a bit more than normal. It is true he wears me down, but

he is not mad. Can it be an illness? I kept worrying and often caught myself crying.” Another 10% of parents themselves did not think there was anything wrong with their child that needed medical help, but still since a referral was made, they considered it may be in the best interests of their child to seek consultation. Remarkably, 30% of parents reported feeling relieved that someone had guided them and expressed hopefulness for future. One father reported, “We always thought there was something wrong with my younger son. Our elder one is quite focused; we had no problems with him. But, with this one, we keep getting complaints. Nobody had earlier suggested seeking medical help. His current class teacher told us that some of these children have psychological problems, cannot focus attention, so we should see a psychiatrist. I actually felt glad that someone has understood him after all. Surprisingly, she (teacher) did not blame us for his problems.” This represented themes with positive valence characterized by relief and cognitively accepting the suggestion. Overall, mothers significantly reported more often negatively charged initial reactions and less often positive reactions as compared to fathers (Chi square- 4.37, p < 0.05).

### 3.2. Causal explanations

Mean number of causes reported per parent were 2.11 (SD - 1.38), with a median of 2 causes per participant. Each parent might have reported multiple explanations and was coded in each category separately. See Table 4. The numbers and percentages for each category, sub-category and theme represent the number and percentage of parents who reported that particular theme/ sub-theme. Any biological causation was reported by 27 (51.82%) parents, while any psycho-social explanation was reported by 33 (63.46%) parents. 10 (19.23%) parents (5 mothers, 5 fathers) reported both the explanations. Illness model (32.69% parents) included causes such as brain problem/ mental defect, obstetric complications (premature birth, very low birth weight, delayed cry, difficult delivery), pregnancy and maternal health related (inadequate nutrition/ weight gain, hyperemesis, maternal hypertension), post-natal (fever, seizures, head injury). Eight parents reported heredity as a reason, and 7 (13.47%) reported intellectual sub-normality in their child as the cause. All the latter children had sub-average intellectual functioning. Other reasons included maternal stress, depression and physical abuse during pregnancy, depression in mother, father’s substance use, not given treatment when advised/ inadequate treatment by doctors and too many medications as an infant. Parents reporting these explanations believed that these factors either led to

**Table 3**  
Initial reactions when advised referral to seek professional help (N = 40).

Themes	Mothers N = 24 n (%)	Fathers N = 16 n (%)	Total N = 40 n (%)
<b>Negative valence</b>			
<b>Denial / Disbelief</b>	9 (37.5)	5 (31.25)	14 (35)
“.....confused, why psychiatrist/ being referred to a psychiatrist...”, “...he is not mad...”, “...why should he be taken to a doctor...”, “.....did not believe...”, “... did not feel good as I thought my child has no problem...”, “.....offended....angry...”, surprised at suggestion...”, “...he is a bit naughty but he is not ill...”, “....teachers not good, finding faults with my child”, “teachers think my child is mad or what.....”, “....took us 1 year to seek first consultation...”			
<b>Ambivalence</b>			
<b>Tensed/ worried/ felt anxious</b>	5 (20.83)	1 (6.25)	6 (15)
“.....felt tensed....”, “....kept on worrying....”, “...felt embarrassed, has it been my fault that his behaviors are so bad....”, “...couldn’t control my tears...”			
<b>Denial/ disbelief soon followed by Anxiety</b>	3 (12.5)	1 (6.25)	4 (10)
“...initially felt angry and confused at the suggestion, but soon started to worry if my child has some illness...” “...I know he is not mad but I started to worry what it (behavioral problems) might be...”			
<b>Did not think there was a medical problem but maybe for best</b>	1 (4.17)	3 (18.75)	4 (10)
“...okay to consult as there had been repeated complaints from school”, “....already showing for epilepsy, so it was okay”			
<b>Positive valence</b>			
<b>Relieved</b>	6 (25)	6 (37.5)	12 (30)
“...glad someone recognized...”, “....always thought should get help for him, but did not know how...”, “....always thought he had a problem...”, “....always thought he had a brain problem...”, “...felt guided...”, “....first time some teacher had suggested this and ..... surprisingly she did not blame us or the child”, “....became hopeful that he would improve...”			

**Table 4**  
Perceptions regarding causal explanations for the problems diagnosed as ADHD.

		N = 52 n (%)	Theme by child gender		Theme by parent gender	
			Male (n = 45)	Female (n = 7)	Father (n = 20)	Mother (n = 32)
Biological	1 Illness model	17 (32.69)	14 (31.11)	3 (42.86)	6 (30)	11 (34.38)
	2 Hereditary	8 (15.38)	7 (15.56)	1 (14.28)	3 (15)	5 (15.63)
	3 Intellectual sub-normality	7 (13.46)	6 (13.33)	1 (14.29)	3 (15)	4 (12.5)
Any biological /illness		27 (51.92)	22 (48.89)	5 (71.42)	10 (50)	17 (53.12)
Psychological	Lack of motivation of the child/ Volitional (Deliberately trying to disturb others)	16 (30.77)	15 (33.33)	1 (14.29)	5 (25)	11 (34.38)
Social – family	Other family members being too liberal	13 (25)	13 (28.89)	0 (0)	8 (40)	5 (15.63)
	Other family members being too critical	6 (11.54)	6 (13.33)	0 (0)	1 (5)	5 (15.63)
	Self too liberal/ critical	6 (11.54)	4 (8.89)	2 (4.44)	2 (10)	4 (12.5)
	Blaming spouse/spouse's family as a bad role model	12 (23.08)	10 (22.22)	2 (4.44)	5 (25)	7 (21.87)
	Inadequate discipline at home	10 (19.23)	10 (22.22)	0 (0)	6 (30)	4 (12.5)
	Marital or family discord	3 (5.77)	3 (6.67)	0 (0)	1 (5)	2 (6.25)
Social - environmental	Inefficient teachers	3 (5.77)	3 (6.67)	0 (0)	1 (5)	2 (6.25)
	Bad company	0	0	0	0	0
Any psycho-social		33 (63.46)	29 (64.44)	4 (57.14)	14 (70)	19 (59.37)

biological causation (affecting the brain development) or a psychological causation (affecting the child's "mind"). Two parents reported that child's excessive interest in video games was responsible for his/ her problems and one reported that inadequate diet was the cause. Amongst the psychological causations, lack of motivation on part of the child to study and correct/ control his problematic behaviors was most common (n = 16, 30.77%). The other common explanation was volitional, i.e. the child was deliberately trying to disturb others. Problems with disciplining at home with blaming either self or spouse and the extended family were very common (from 11.54% to 25%) (See Table 4). Mothers often reported that others did not understand the child and did not provide adequate love. On the other hand, some parents reported that grandparents were either too liberal or too critical of the child. Three (5.77%) parents each cited marital or family discord and inefficient teachers respectively. Fathers significantly more often reported other family members being liberal than mothers (Chi square = 3.90, p < 0.05). Other differences did not reach a significant level. One father reported that his spouse "did not co-operate for intercourse and he ejaculated partially outside" and that this was the reason for the problems in the index child. While another father simply said, "(it) can happen to anyone" and had not given any explanations. None of the parents reported any spiritual or super-natural beliefs as a causal model. Also, no parent implicated falling into bad company as a causal factor. Differences in explanatory models by gender of the child were not significant. There was no difference in reporting of biological or psycho-social causes based on the valence of initial reaction.

### 3.3. Perceptions regarding diagnosis

Eight participants spontaneously reported that the child suffered from ADHD/ "illness of hyperactivity", while another 25 reported the same when specifically asked if they knew the diagnosis, making a total of 63.46%. One parent reported mental retardation as the diagnosis, while the remaining 19 (36.54%) parents said that they were not aware of the diagnosis. Out of these 33 parents (19 mothers and 14 fathers), 28 (84.85%) had learnt the diagnosis from the doctors, while remaining 5 had come to the conclusion through reading related books or newspaper articles and own observations. 31 out of these 33 parents (93.94%) agreed to the diagnosis, could describe the symptoms in their child and simultaneously agreed that it is a brain disorder on probe question. 10 of these 31 parents (32.26%) had only reported psycho-social causes on the semi-structured interview for exploration of causal perceptions. 13 (41.93%) had given biological explanations, 7 (22.58%) had given both biological and psycho-social explanations and

one parent had given neither.

## 4. Discussion

Our study focused not only on causal attributions, but also on the cognitive and emotional states of parents during the process of help seeking, and this is unique to our study. There have been two recent studies that explore the pathways to care for ADHD in our settings and reasons provided by parents that may have resulted in delay in seeking treatment (Anand et al., 2018; Arya et al., 2015). Our study, in turn focuses in-depth on one of the most important reasons for such delay, i.e. parental causal explanations (Wright et al., 2015), as attempted earlier by Wilcox et al., 2007. Effective elucidation of parental causal beliefs necessitates that the thoughts and associated feelings are expressed and interpreted in terms meaningful to the parents. Cultural, ethnic and linguistic differences between the ethnographer and the interviewees may limit the scope of interview to the a priori hypothesis of the researcher and important information may not be tapped (Gidwani et al., 2006; Hillemeier et al., 2007; Wilcox et al., 2007). Keeping this in mind, the index study involved interviewers who belong to the same culture as that of the patients and their parents. Additionally, the parents were asked to express their causal models in their own native preferred language. Our study may thus have addressed some of the limitations of earlier studies, though there still exists a divide between the ethnographers and the interviewees based on academic hegemony.

It has been recognised that there are cultural differences in parents' understanding of causation, help-seeking and treatment of ADHD (Bussing et al., 1998, 2003; Bussing et al., 2005; Sayal et al., 2002; Wilcox et al., 2007) and cultural attitudes towards mental illness may significantly affect parental perception and help-seeking as well as acceptance of the professional help for child mental health problems (Reardon et al., 2017; Wilcox et al., 2007; Wright et al., 2015). This is somewhat evident from our finding that parents initiated the referral in only a fifth of the cases; in keeping with literature from the Asian sub-continent for ADHD (Anand et al., 2018; Arya et al., 2015) and for other neuro-developmental disorders (Chakraborty et al., 2014; Preeti et al., 2017). These figures are comparatively lower than that seen in Western populations (Sayal et al., 2002). Rather, initial reaction of some parents reflected that problems were construed as simply exaggeration of normal misbehavior or that children were naughty. Such beliefs have been considered as one of the most frequent reasons for delay in treatment seeking in our settings (Anand et al., 2018; Arya et al., 2015). Parental reactions also reflected stigmatizing stereotype attached to

psychiatric consultation, seen in literature for ADHD (Anand et al., 2018; Arya et al., 2015) as well as for other childhood disorders from this part of the world (Preeti et al., 2017). However, our parents also had worry as a pre-dominant initial reaction either immediately following denial or on its own, giving rise to ambivalence and possibly a movement towards acceptance. However, results of index study are only indicative and not conclusive as the design did not capture the movement through stages. Surprisingly, a significant proportion of parents were relieved at the suggestion of the consultation. This highlights that though parents might not be aware of an illness perspective, they may still accept the same.

India has largely a patriarchal family system (Avasthi, 2010). However, an interesting finding emerged regarding the different loci of decision making for general decisions vis-à-vis for the specific decision related to professional help seeking; with mothers dominating in the latter role. This may reflect the roles that the mothers play in terms of caregiving and their involvement in the parent-teacher interactions. Also, mothers of children with behavioral disabilities are frequently blamed for their child's misbehavior (Blum, 2007) and this may put an additional strain on these mothers, precipitating a consultation. In the index study, psycho-social explanations were marginally more frequent than biological explanations. The former explanations were related to child related psychological factors and family/ school related social factors; but none reported any supernatural beliefs. This was contradictory to findings from Goa, India (Wilcox et al., 2007) and that seen for other neuro-developmental disorders such as intellectual disability (Chakraborty et al., 2014), and as seen in adult literature (e.g. Grover et al., 2014). Also, overall more than half of the parents gave a biological explanation, which was far more frequent than that found by Wilcox et al (2007). Differences might reflect socio-cultural variations within different regions or increased awareness and changing socio-cultural beliefs over time. Also, one-third of our parents gave specific medical causes (e.g. related to pregnancy and child birth), which is much higher than that reported from earlier studies (Bussing et al., 1998, 2003; Sonuga-Barke and Balding, 1993; Wilcox et al., 2007). One reason may be that some of these children had sub-average intellectual functioning.

Findings from our study show that biomedical beliefs of causation may not be as infrequent as once construed to be, though there might be co-existing psycho-social beliefs. From a bio-psycho-social perspective, though, psycho-social factors do not have convincing evidence as etiological factors (Thapar et al., 2012), these nevertheless, play a crucial role in maintaining or even exacerbating symptoms of ADHD, development of heterotypic co-morbidities and help seeking. Keeping this in mind, the psychosocial interventions must be developed and provided in such a way that these do not directly come into conflict with the parental psycho-social etiological models, as lack of incorporation of the same may lead to poor treatment adherence. Hence, parental perceptions need to be incorporated towards development of culturally valid psycho-social interventions. For example, considering family members to be too liberal or too strict may reflect the unique family dynamics in the Indian and the wider Asian context. This belief is based in the social reality of power dynamics within the family and reflects parenting inconsistencies (where parenting invariably includes significant adults other than parents in the family). A culturally relevant psycho-social intervention should, therefore, emphasize on consistencies between all adults of the family including grandparents and extended family, and as far as possible, must include these members directly in the intervention. Our parents also hold bio-medical beliefs; hence it seems most relevant to present the problem in its bio-psycho-social context, which would also mitigate the self-blame and blame towards other members that was seen in our parents.

The study had some important limitations. First, the possibility of recall bias for reporting of initial reactions cannot be ruled out. Moreover, since a significant proportion of parents had been educated/informed about the diagnosis by the doctors; this knowledge might

have affected their reporting. Though the interview questions were phrased so as to mitigate this as much as possible, such a bias cannot be ruled out. Also, these parents were the ones who sought professional help. So, these results are not applicable to parents who did not eventually seek medical help. Lastly, no structured interview schedule was used for confirming the diagnosis of ADHD and ruling out other co-morbidities; this may have led to some confirmatory bias in defining cases. Additionally, these co-morbidities may have affected the parental causal explanations.

#### Conflict of interest

None

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