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ORIGINAL ARTICLE

General practitioners' (GP) attitudes and knowledge about attention deficit hyperactivity disorder (ADHD) in Ireland

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Abstract

Background ADHD is the most frequent reason for attendance at Child and Adolescent Mental Health Services (CAMHS). General practitioners (GPs) play a key role in recognising symptoms, referring for assessment and supporting ongoing treatment. However, there is an ambiguous understanding of ADHD among GPs, and different attitudes regarding the validity of ADHD as a construct. The present study aims to explore and identify GPs attitudes and beliefs about ADHD in the Irish context, and to find out the association of those attitudes with other factors.

Methods Representative sample of qualified GPs registered to the Irish Medical Directory. The survey included questions about GPs' practice, attitudes towards ADHD, knowledge of symptoms and workup for ADHD, previous training and personal experience of ADHD.

Results A hundred and forty GPs participated (response rate 28%). Factor analysis indicated 58.8% expressed a positive attitude towards ADHD. Those who have positive attitudes were more likely to be between 36 and 55 years old, seeing fewer children with suspected ADHD per year and working as part of a primary care team. Years of practice, personal experience of ADHD, training and knowledge in ADHD and access to CAMHS or psychology were not significantly related to either positive or negative ADHD attitudes.

Conclusions Despite the high rates of ADHD among children, a slim majority of Irish GPs have positive attitudes towards ADHD. This could lead to undiagnosed or misdiagnosed cases. Strategies need to be considered to address this.

Keywords ADHD · Attitudes · General practitioners · Ireland

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Introduction

Attention deficit hyperactivity disorder (ADHD) is the most prevalent psychiatric disorder of childhood and affects about 5% of children and adolescents [1] with 60% of cases continuing to be symptomatic during adulthood [2]. ADHD is the single most frequent reason for attendance at Child and Adolescent Mental Health Services (CAMHS) and yet up to two thirds of children who meet criteria for ADHD receive neither diagnosis nor services [3]. In Ireland, the UK and many other EU countries, general practitioners (GPs) play a key role in recognising symptoms, referring for assessment and supporting ongoing treatment, yet numerous studies involving GPs across times and settings indicate an ambiguous understanding of ADHD, unhelpful attitudes regarding the validity of ADHD as a construct and reluctance to become involved in

shared care practice, partly contributed to by lack of access to training [4]. In Ireland, a large nationally representative sample ($N = 8750$) of parents indicated that less than 1% of children had received a formal diagnosis of ADHD [5]. The rate of clinical diagnosis is similarly around 1% in the UK [6] which is at odds with the accepted worldwide prevalence rate of 5.3% [1] and suggests either under detection or reluctance of referral to, or attendance at CAMHS in addition to under diagnosis within CAMHS. Similar rates of under diagnosis and treatment have been reported in other countries regarding ADHD [7], and mental illness more generally [8]. It is recognised that rates of identification of mental health difficulties in children and youth in primary care practitioners are low, [9] and when identified, referral to CAMHS occurs for about 50% of children [8]. Parental concern rather than clinician suspicion more often determined the rates of onward referral. Klasen and Goodman [10] conducted a series of qualitative interviews with UK GPs (10) and parents (29), and found significant differences between them in the conceptualization of ADHD, and the expectation of treatment. Parents viewed ADHD to be biologically mediated, benefitting from diagnosis and treatment. In contrast, many GPs viewed ADHD as transient, an expression of psychosocial stressors, being less clear about the merits of diagnosis or treatment. There was a concerning dichotomy with parents fearing blame, and GPs viewing parental wish for diagnosis as a way to minimise or deflect from shortcomings in parenting, leading to significant barriers in pathway to care [11]. Whether these attitudes still apply remains to be identified, and therefore, identifying GPs specific attitudes towards ADHD represents an important first step in understanding the low attendance referral and treatment rates in CAMHS of youth with ADHD.

In a systematic review of GPs' attitudes to ADHD in countries where they are first-contact gatekeepers [4], few studies were found addressing this topic: only 11 papers (10 studies) spanning from 2000 to 2010 met the inclusion criteria, conducted predominantly in the UK, Europe and Australia. Across studies, the following themes were identified: Difficulties with rates of recognition; ADHD controversy (medicalisation, stigma and labelling); varied causes of ADHD; GPs and ADHD diagnosis; GPs and ADHD treatment and sources of information. GPs had mixed attitudes regarding the validity of ADHD as a construct, the role of medication and how parenting contributed to presentation. A paucity of training was identified, and a reluctance of GPs to become involved in shared care practice. Some GPs were reported to be reluctant referrers, wishing to prevent children being exposed to the stigma of a diagnosis, and citing a fear of 'labelling' that has been noted by others to be a deterrent [12].

Alongside the growing literature supporting biological contributions to ADHD, more recent attitudinal studies are lacking as are studies of GPs' attitudes in Ireland [13, 14]. Therefore, this study proceeded to explore current GPs' attitudes and knowledge regarding ADHD in Ireland. This work has two aims (a) to explore and identify GPs attitudes and beliefs about ADHD in the Irish context, and (b) to find out the influences and the association of those attitudes (positive or negative) with other factors including previous knowledge, training and experience, personal exposure to ADHD children, place of practice, type of practice, assess to specialist and demographics (age and gender).

Methods

Participants and sampling method

Participants were qualified GPs registered to the Irish Medical Directory (IMD) of GPs. To sample geographically representative proportions, a stratified sampling framework for each of Ireland's 26 counties was constructed from the 2500+ GPs across Ireland listed in the IMD, and 500 GPs were sampled proportionately from within each county. Both paper and electronic replies were facilitated and a follow-up letter sent to encourage maximum response rate. (Response rate 28%.)

Questionnaires

A study-specific questionnaire was developed with reference to the systematic review [4] and through an iterative process, with input from clinicians (FMcN, BG), researcher (MTG) and GP (WC) to include variables/attitudes considered important to establish what might facilitate or hinder identification, referral or treatment of ADHD in children. These included the following:

a) Demographics (gender, age group, years since qualification)
b) Questions regarding their practice (whether part of a primary care team), whether they are in the general medical scheme (GMS), i.e. have a contract with the health service executive (HSE) to provide services free of charge to some patients, reimbursed by the HSE, if they have access to primary care psychology, interest for sharing care with CAMHS (all the foregoing were yes/no responses), access to CAMHS, annual number of children of suspected ADHD seen, and annual number of children of confirmed ADHD.
c) Previous training in ADHD was elicited via 4 questions: "staying updated with ADHD", "Have you had any ADHD specific training", "Have you worked in Child Psychiatry since medical qualification" "Was ADHD part of your Post graduate training". If any GP had any "yes" in any of those variables, this was coded as "yes" in the total questionnaire, and those who had no in all four variables were coded as "no".
d) ADHD attitudes: 17 questions/statements regarding their beliefs and attitudes towards ADHD, aetiology and

treatment were included (Table 2) with response options of "yes", "no" and "unsure":

e) Knowledge of ADHD symptoms: 17 questions assessed GP's knowledge of symptoms of ADHD. Each correct answer was awarded one point and for each incorrect or missing or "I don't know" answer zero. The maximum total score was 17. The full set of questions, listed in Table 3, covers key ADHD symptoms of hyperactivity, impulsivity and inattention plus 'distractor' items relating to symptoms of other DSM diagnoses as a review of previous research identified GP confusion between symptoms in some studies [4].

f) Questions regarding the GPs typical assessment in cases of suspected ADHD (knowledge of workup) included as follows: Whether they conduct/collect an *Individual interview with child*, *Child's history from parent*, *Developmental history*, *Family history of ADHD*, *Physical examination*, *Collateral information from school*, *EEG*, *ECG*, *Blood tests*, *Neurology screen*, *Blood pressure*, *Neuroimaging*, *Food diary.* This questionnaire was rated similarly as above. The maximum total score was 13.

g) Personal experience of ADHD (yes/no answer).

Ethics

The study, as it addressed professionals' attitudes to their normal range of professional activities, and did not cover sensitive topics, was granted exemption from full ethical review by the University College Dublin's Office of Research Ethics.

Statistics

Descriptive statistics are presented as counts and proportions for categorical data, and as means and standard deviations (SD) for continuous data. For bivariate comparisons, parametric and non-parametric tests were used appropriately to the distribution of the data. The 17 questions (Table 2) assessing GP attitudes to ADHD were entered in an exploratory factor analysis model to identify patterns of attitudes. To have interpretable factors ("negative" vs "positive" attitudes), a forced two-way factor solution analysis was performed using principal component analysis extraction with quartimax rotation and Kaiser normalization. Finally, a multivariate model was conducted, controlling for confounders, to establish which GP demographic, attitudinal, practice-based factors and other variables were independently associated with GP ADHD attitudes. In the initial model, dependent variables were the factor scores from the factorial analysis of attitudes (loadings) and independent variables were demographics (age and gender), years since qualification, knowledge of ADHD symptoms, adherence to the clinical guidelines for ADHD, annual number of children of suspected ADHD, annual number of children of confirmed ADHD, previous ADHD training, personal experience of ADHD, interest for sharing care, access to primary care psychology, access to CAMHS, part of a primary care team and registration in GMS list. Variables that did not contribute significantly to the model were dropped one by one until a parsimonious model was found. For the statistical analysis, IBM (SPSS) v.24 software was used.

Results

Descriptive statistics

The sample consisted of 140 GPs; demographics and other examined variables are presented in Table 1.

Factor analysis of GP attitudes to ADHD

An exploratory factor analysis and scree plot indicated a six-factor solution which was uninterpretable. Therefore, in order to reduce the factors to those meaningful and to facilitate consequent analyses of the data, a two-factor solution was performed. The two-factor solution explained 35% of the variance. Kaiser-Meyer-Olkin measure of sampling adequacy was 0.751 and Bartlett's test of sphericity $p < 0.001$ ($x^2 = 485.64$, df 136), both indicating that the data is suitable for factor analysis (adequate sampling, multivariate normal distribution and equal variance). The two factors and the loadings are presented in Table 2. One with "negative" attitudes towards ADHD (FC1 factor in Table 2) suggests that ADHD is a fashionable disorder, difficult to distinguish from normal behaviour, and parents seek diagnosis as an excuse for bad parenting and educational benefits like Disability Access to Education (DARE) and the Domiciliary Care Allowance (DCA) offered in Ireland to families. The second group of attitudes (FC2) contains "positive" views where GPs agree that ADHD is a valid diagnosis, the symptoms were not attributed to bad behaviour and that the diagnosis is perceived as helpful for children and parents.

Bivariate statistics comparing characteristics of GPs with positive/negative attitudes to ADHD

Based on the factor scores of each individual GP from the previous analysis, GPs were assigned to either of two categories: those with more "positive" attitudes (higher individual scores in FC2) and those with more "negative" attitudes (higher scores in FC1) towards the ADHD. Seventy GPs (58.8%) had more positive attitudes in contrast to 49 (41.2%) with "negative". Examining differences between the two categories and other variables revealed an age difference, in that GPs who were younger were more likely to have

Table 1 Demographics and other characteristics of the participated GPs

Variables	N responded (%)	Count	Percent	Mean	SD
Gender	94 (67.1)				
Male		56	59.6		
Female		38	40.4		
Age group	138 (98.6)				
25–35		7	5.1		
36–45		33	23.9		
46–55		41	29.7		
56–65		42	30.4		
66+		15	10.9		
Any ADHD training (overall)	138 (98.6)				
Yes		55	39.9		
No		83	60.1		
Was ADHD part of your PG training?	136 (97.1)				
Yes		18	13.2		
No		118	86.8		
Do you have the opportunity to stay up to date about ADHD?	130	92.9			
Yes		44	33.8		
No		86	66.2		
Have you had any other ADHD-specific training?	136	97.1			
Yes		5	3.7		
No		131	96.3		
Have you worked in child psychiatry since medical qualification?	137	97.9			
Yes		6	4.4		
No		131	95.6		
Part of a primary care team	131 (93.6)				
Yes		81	61.8		
No		50	38.2		
GMS list of practice	122 (87.1)				
Yes		118	96.7		
No		4	3.3		
Access to primary care psychology	133 (95.0)				
Yes		86	61.4		
No		47	33.6		
Interest for sharing care	134 (95.7)				
Yes		52	38.8		
No		47	35.1		
Unsure		35	26.1		
Asses to CAMHS	138 (98.6)				
Always		87	62.1		
Sometimes		36	25.7		
Rarely		15	10.7		
Personal experience of ADHD	126 (90.0)				
Yes		24	19.0		
No		102	81.0		
Years since qualification	123 (87.9)			26.59	11.25
Knowledge of symptoms of ADHD	140 (100)			9.68	3.23
Adherence to the clinical guidelines for ADHD	136 (97.1)			8.71	2.01
Annual number of children of suspected ADHD	121 (86.4)			6.99	8.78
Annual number of children of confirmed ADHD	112 (80.0)			9.80	8.58

"negative" attitudes, and GPs who were part of a primary care team more likely to have "positive" attitudes (Table 3).

Multivariate analysis identifying effects of GP characteristics on ADHD attitudes

To examine the effects of GP variables on attitudes (positive and negative), a multivariate model was conducted with the dependent variable the scores of each factor (FC1, FC2) as described above. The parameter estimates and their significant of the final model are presented in Table 4. The error variance and the covariance matrices of the dependent variables were equal across groups (Levene's tests for FC1 $F = .840$, df1: 12, df2: 76, $p = .609$ for FC2 $F = 1.719$, df1: 12; df2: 76 $p = .080$ and Box's $M = 28.57$, $F = .987$, df1: 24, df2: 1452.3, $p = .481$).

As Table 4 illustrates, it is significantly more likely for GPs to have "positive" attitudes if they are between 36 years old and 55 (compared) to older, if they see fewer children with

Table 2 Factor analysis of the attitudes. Loadings of the two-factor solution

Attitudes		Counts (%)		Two-factor solution loadings	
		FC1	FC2	FC1	FC2
ADHD is a clearly defined psychiatric disorder	Yes	19 (38.8%)	50 (71.4%)		.33
	No	12 (24.5%)	5 (7.1%)		
	Unsure	18 (36.7%)	15 (21.4%)		
ADHD is a new, 'fashionable' disorder	Yes	25(51.0%)	4 (5.7%)	.72	
	No	16 (32.7%)	63 (90.0%)		
	Unsure	8 (16.3%)	3 (4.3%)		
ADHD is society's excuse for badly behaved children	Yes	19(38.8%)	3(4.3%)	.60	
	No	12(24.5%)	62 (88.6%)		
	Unsure	18 (36.7%)	5 (7.1%)		
ADHD is a valid diagnosis	Yes	33 (67.3%)	70 (100.0%)		.53
	No	1 (2.0%)	0 (0.0%)		
	Unsure	15 (30.6%)	0 (0.0%)		
It is difficult to differentiate between ADHD and normal child behaviours	Yes	26 (53.1%)	19 (27.1%)	.61	
	No	13 (26.5%)	47 (67.1%)		
	Unsure	10 (20.4%)	4 (5.7%)		
Children with ADHD do not try hard to control themselves	Yes	7 (14.3%)	34 (48.6%)		.42
	No	23 46.9%)	12 (17.1%)		
	Unsure	19 (38.8%)	24 (34.3%)		
An ADHD diagnosis is helpful for a child	Yes	23 (46.9%)	57 (81.4%)		.71
	No	8 (16.3%)	2 (2.9%)		
	Unsure	18 (36.7%)	11 (15.7%)		
An ADHD diagnosis relieves families from stress and supports problem-solving	Yes	21 (42.9%)	54 (77.1%)		.61
	No	14 (28.6%)	8 (11.4%)		
	Unsure	14 (28.6%)	8 (11.4%)		
An ADHD diagnosis removes stigma of bad parenting	Yes	26 (53.1%)	7 (10.0%)	.75	
	No	10 (20.4%)	42 (60.0%)		
	Unsure	13 (26.5%)	21 (30.0%)		
An ADHD diagnosis is stigmatising for a child	Yes	26 (53.1%)	27 (38.6%)		− .30
	No	9 (18.4%)	26 (37.1%)		
	Unsure	14 (28.6%)	17 (24.3%)		
Children with ADHD misbehave because they do not want to follow the rules	Yes	6 (12.2%)	4(5.7%)		− .49
	No	32 (65.3%)	59 (84.3%)		
	Unsure	11 (22.4%)	7 (10.0%)		
Children's (ADHD-related) inattentiveness is caused by unwillingness to please	Yes	5 (10.2%)	0 (0.0%)		− .48
	No	34 (69.4%)	64 (91.4%)		
	Unsure	10 (20.4%)	6 (8.6%)		
Media influence affects the conception of ADHD	Yes	37 (75.5%)	51 (72.9%)	.10	
	No	4 (8.2%)	11 (15.7%		
	Unsure	8 (16.3%)	8 (11.4%)		
Parents are reluctant to give ADHD medication to their child	Yes	17 (34.7%)	33 (47.1%)		.27
	No	19 (38.8%)	23 (32.9%)		
	Unsure	13 (26.5%)	14 (20.0%)		
Parents primarily seek ADHD diagnosis for school/DARE accommodations	Yes	20 (40.8%)	9 (12.9%)	.65	
	No	5 (10.2%)	45 (64.3%)		
	Unsure	24 (49.0%)	16 (22.9%)		
Parents primarily seek ADHD diagnoses for the DCA	Yes	12 (24.5%)	1 (1.4%)	.69	
	No	13 (26.5%)	58 (82.9%)		
	Unsure	24 (49.0%)	11 (15.7%)		
Parents seek ADHD diagnosis as an excuse for t heir child's bad behaviour	Yes	32 (65.3%)	4 (5.7%)	.63	
	No	5 (10.2%)	54 (77.1%)		
	Unsure	12 (24.5%)	12(17.1%)		

suspected ADHD per year, if their practice is in the GMS and if they work as part of a primary care team. Years of practice, personal experience of ADHD, training and knowledge in ADHD and access to CAMHS or psychology did not bear any significant relationship to either positive or negative ADHD attitudes.

Discussion

GPs practicing in Ireland completed this survey assessing their views and attitudes to ADHD. Most GPs were part of a primary care team, and nearly all were on the GMS, with reasonable access to both community psychology services and

Table 3 Bivariate statistics between those with "positive" attitudes vs "negative" attitudes about ADHD

Variables	N negative	N positive	Test/sign.
Gender			*$x^2 = .390$, df: 1, $p = .532$*
Male	16	32	
Female	14	21	
Age group			*$x^2 = 5.134$, df: 4, $p = .274$*
25–35*	5	1	***p < .01****
36–45	9	16	
46–55	13	23	
56–65	16	21	
66+	6	9	
Any ADHD training			*$x^2 = .449$, df: 1, $p = .503$*
Yes	18	30	
No	31	40	
Part of a primary care team			***$x^2 = .919$, df: 1, $p = .002$***
Yes	22	48	
No	26	17	
GMS list of practice			*$x^2 = .09$, df: 1, $p = 0.764$*
Yes	42	57	
No	2	2	
Access to Primary Care Psychology			*$x^2 = .001$, df: 1, $p = .981$*
Yes	31	45	
No	16	23	
Interest for sharing care			*$x^2 = .70$, df: 2, $p = .702$*
Yes	17	28	
No	19	22	
Unsure	11	17	
Asses to CAMHS			*$x^2 = .95$, df: 2, $p = .622$*
Always	32	44	
Sometimes	10	19	
Rarely	6	6	
Personal experience of ADHD			*$x^2 = 1.062$, df: 1, $p = .303$*
Yes	6	14	
No	37	50	
	N, mean (SD)	*N*, mean (SD)	
Years since qualification	45, 26.51 (12.83)	62, 27.48 (10.0)	*$t = .440$, df: 105, $p = .661$*
Knowledge of symptoms of ADHD	49, 9.6 (3.07)	70, 9.9 (3.14)	*$t = .601$, df: 117, $p = .549$*
Adherence to the clinical guidelines for ADHD	49, 8.75 (1.84)	68, 8.7 (1.9)	*$t = .320$, df: 115, $p = .749$*
Annual number of children of suspected ADHD	43, 6.5 (11.4)	61, 6.8 (6.06)	*$z = 1.67^{\$}$, $p = .094$*
Annual number of children of confirmed ADHD	39, 7.15 (5.2)	57, 11.16 (9.8)	*$z = -1.86^{\$}$, $p = .062$*

In italics the tests used and the results, the significant results are in bold

*Significant at the 0.01 level

$ Mann-Whitney test

CAMHS. Fewer than half had any training in ADHD, but nearly 1 in 5 had a personal experience of ADHD.

A slim majority of GPs had positive attitudes to ADHD, which is in accordance with most previous studies examining attitudes and views of GPs in other countries [12, 15], and also in accordance with the view of Europe-based physicians that ADHD is a valid diagnosis [16].

Although it was expected that there would be an association between "positive" attitudes and better knowledge about ADHD in both, symptomatology and clinical valuation, the results of this study do not confirm it. It seems that, having controlled for other factors, the positivity of GPs' ADHD attitudes is not affected by extent of ADHD knowledge or practice. Equally surprising, GP training did not have any

Table 4 Parameter estimates and significant effects of the final multivariate model

Parameter estimates							
Dependent variable	Parameter	B	Std. error	*t*	Sig.	95% confidence interval	
						Lower bound	Upper bound
FC1 = "negative" attitudes	Intercept	.015	.542	.028	.977	− 1.062	1.093
	25–35 years	.840	.517	1.625	.108	− .189	1.869
	36–45 years	.105	.358	.294	.770	− .607	.817
	46–55 years	− .227	.351	− .647	.519	− .927	.472
	56–65	.271	.335	.809	.421	− .396	.939
	66+	0[a]	–	–	–	–	–
	Number of children with suspected ADHD yearly	.002	.012	.171	.865	− .023	.027
	GMS list yes	.235	.515	.456	.650	− .790	1.260
	GMS list = no	0[a]	–	–	–	–	–
	Primary care team = yes	− .488	.221	− 2.212	*.030*	− .927	− .049
	Primary care team = no	0[a]	–	–	–	–	–
FC2 = "positive" attitudes	Intercept	− 2.079	.497	− 4.182	.000	− 3.068	− 1.090
	25–35 years	.579	.475	1.220	.226	− .365	1.524
	36–45 years	.875	.328	2.666	*.009*	.222	1.529
	46–55 years	.622	.323	1.928	.057	− .020	1.264
	56–65 years	.477	.308	1.550	.125	− .135	1.090
	66+ years	0[a]	–	–	–	–	–
	Number of children with suspected ADHD yearly	− .027	.011	− 2.390	*.019*	− .050	− .005
	GMS list = yes	1.475	.473	3.119	*.003*	.534	2.415
	GMS list = no	0[a]	–	–	–	–	–
	Primary care team = yes	.468	.203	2.311	*.023*	.065	.871
	Primary care team = no	0[a]	–	–	–	–	–

The signs (−) or (+) before the estimates (B) shows the direction of the relationship

The significant results are in italics

[a] Reference category

significant effect on attitudes to ADHD. These findings, which contradict our assumption that being better informed would be associated with more positive attitudes, may indicate the strength of the affective or evaluative component of attitudes [17]. Despite adequate knowledge about a subject, individuals may still have negative or oppositional views about the subject. It must be noted that whether GPs' attitudes were "positive" or "negative", both groups had a low average score on knowledge and clinical evaluation scales, thus (see Table 3) limiting the statistical differences. However, similar disconnections between beliefs and knowledge have been found among lay publics [18] and in school teachers [19].

In contrast, factors associated with either positive or negative ADHD attitudes included the setting of the practice and GP age. GPs who work alone were more likely to have "negative" ADHD attitudes. Although no previous study had examined this particular factor for ADHD attitudes, other studies have suggested that teamwork generally promotes patient safety and perhaps acceptance of more diverse viewpoints [20], and doctor's knowledge and professionalism [21]. Similarly, GPs registered with GMS were more likely to have "positive" attitudes compared to those who do not, although this finding needs to be interpreted with caution as the number of practices not included in the GMS list was very small (only four). The number of patients with suspected ADHD attending the GP had a negative impact on the GP's ADHD attitudes. This intriguing finding requires further exploration.

GPs expressing positive attitudes towards ADHD were more likely to be aged between 36 and 45 compared to older ones (65+). The present data do not allow us to make inferences about this age-related association, but perhaps age also reflects years of experiences and previous training (although both factors were not significant). For instance, older GPs may never have been taught about ADHD although they have more years of experience but at the same time younger GPs may be have taught about ADHD but they lack experience. Alternatively, these more

'positive' attitudes to ADHD among a younger GP cohort may reflect wider social acceptance of the construct in more recent times.

Personal experience of ADHD was also unrelated to attitudes. Previous research in lay persons has also showed similar results [18, 22].

Hitherto, the focus of activity to optimise access to ADHD care was to provide training for GPs as a way to ensure earlier recognition, and appropriate onward referral to the necessary services and this would seem appropriate based on these results. Indeed, only just over half of this cohort had any training in ADHD, and numerous studies exist in which GPs have specifically requested additional training. However, this study suggests that training alone does not impact on negative attitudes that can act as a barrier to referral, and other methods are required to target unhelpful negative views. However, further exploration as to the components of training that GPs have received and the specific aspects linked to improved attitudes is also required. These additional methods would seem most important for older aged GPs and those who work in solo practice.

Limitations and strengths This study has two important limitations. First is the small sample—although this is offset by the fact that the response rate (28%) is similar to other recent studies on mental health and ADHD in Ireland and Northern Ireland [23, 24] and that the representative nature of the cohort (different geographical locations and nationally representative with a reasonable distribution of age and gender) allows for generalisation to the wider GP group. A second limitation of the study might be the use of factor analysis as a way to analyse the attitudes to ADHD, which could be characterised as existing along a dimension rather than a dichotomy. By forcing the two-dimension solution in the factor analysis, we have forced the attitudes to be seen as "negative" or "positive", inevitably losing some data from the borderline cases. However, the benefit of this analytical approach was that it allowed for subsequent multivariate analysis making the data more interpretable. The study also has further strengths. It is the first study, to our knowledge, reporting on the views and practice of a cohort of GPs working in Ireland regarding ADHD which shows that a majority of GPs in Ireland (albeit a slim majority of 59%) have a positive attitude to ADHD but with low knowledge of symptomatology and adherence to the clinical guidelines in assessment. Similarly, it established that attitudes are independent of previous knowledge about ADHD and that teamwork in primary care influenced positive attitudes among clinicians to ADHD.

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