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Research Article

KNOWLEDGE OF FAMILY PHYSICIANS ABOUT ADHD & PERCEIVED BARRIERS FOR BETTER ADHD CARE

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ABSTRACT
The objective of the study was to assess the knowledge of family physicians about ADHD and identify the perceived barriers in delivery of care from Primary care to the child with ADHD and their family. Primary health care clinics affiliated to Riyadh Military Hospital in Riyadh, Saudi Arabia. Cross-sectional survey of 130 Family physicians. A self-administered pre-validated questionnaire, based on the Centre for Evaluation and Program Improvement in Atlanta (2007) "ADHD project final report", has been used. The average score of the overall knowledge about ADHD was relatively poor with an average of 52.1 % and a minimum score of 0.0% and a maximum of 72%. Results also suggest that individual physicians vary widely in their perception of barriers to providing better ADHD care; while the mean score for the cumulative barriers was 23.02(±9.49), indicating that the average amount of the all over barriers endorsed is about 57.5%, some physicians perceive very few barriers (32.5%) preventing them from providing better care while others perceive many barriers (82.5%). Concerns about diagnostic complexity, time constraints, insufficient education and/or training about ADHD, and concerns regarding misuse of stimulant medications were the reasons cited as main barriers. The findings of this study suggest that family physicians do not feel equipped to diagnose and/or manage patients with ADHD. The development of a child and adolescent mental health team can provide a secure environment for dealing with ADHD patients in the community and support the family physicians in their practice by providing the proper education and training.

INTRODUCTION
While awareness and recognition of adult ADHD has grown rapidly during the last few years, the disorder remains under-recognized and under-treated when compared to other commonly occurring mental health disorders such as mood, anxiety, or substance use disorders (Wang, 2005). It is suggested that only 1 in 4 adults with the disorder have been diagnosed and are receiving adequate medical attention (Castle *et al.*, 2007).
Shaw *et al.*, (2000) indicated that the need for specialised clinical services to diagnose and manage ADHD in children and young people has increased rapidly, as the workload accounted for by ADHD in clinical paediatric and child psychiatry clinics has increased up to 10-fold by the end of the last century. The National Health and Medical Research Council in Australia (1996) declared that many services are struggling to cope with demand.
The role of general practitioners in diagnosing behavioural disorder such as ADHD is not clear and there are some controversies about it (Jawaid *et al.*, 2008). In many countries, the importance of primary care involvement with ADHD is increasing due to the rising numbers of patients who present with the disorder (Valentine, 1996). In USA primary care provides a major avenue for the delivery of services to children with ADHD (Burns, 1995).
This is supported by the American Academy of Paediatrics (2001) which affirmed the critical role of primary care providers in the delivery of services to children with ADHD. The American Academy of Paediatrics (2000) recommended that primary care physicians should identify and refer patients at the severe end of the ADHD spectrum, and reassure and manage those with less severe symptoms. Their argument is that by offering continuity of care, primary care providers are able to identify the development of ADHD and provide counselling with support that is individualised to meet the needs of the child and his family.

Although general practitioners should have adequate knowledge to make probable diagnosis of behavioural disorder such as ADHD (Kelly and Aylward, 2005), there are many barriers that need to be tackled before implementing shared protocols for ADHD screening and management (Thapar and Thapar, 2002), e.g. the willingness of general practitioners to diagnose and manage ADHD is unknown, there is little research on the current knowledge levels and attitudes of GPs towards ADHD (Barbaresi, 1996). Therefore, the attitudes, training needs and information requirements of GPs must be assessed if they are to have a role in ADHD care (Shaw *et al.*, 2003).

According to several published reports, most primary care providers have received little or no relevant training in ADHD care (Camp *et al.*, 1997). In general, they are not trained in management strategies appropriate to ADHD care, such as family therapy, behavioural therapy or classroom management strategies (Mitchell and Shaw, 2000). Even in well developed countries like UK reports showed that general practitioners did not believe that they were equipped with adequate knowledge to diagnose or manage ADHD (Thapar and Thapar, 2002).

Although, general practitioners have the advantage of building understanding through sequential consultations over time, demands on general practice are heavy and allow little time with an average of 13.5 minutes per consultation (Queensland Department of Health, 1996), which is insufficient time to explore the complex issues of childhood behavioural problems.

There were no published studies exploring the knowledge of general practitioners regarding ADHD in Saudi Arabia. Hence, as a first step in reviewing the need to organise a specialised service to manage ADHD is to find out wither the general practitioners as a group are capable of diagnosing and managing childhood ADHD, the extent of their knowledge and the appropriateness of their management practices must be assessed.

Diagnostic Criteria for ADHD

ADHD is shaped by a complexity of symptoms. There is no special test to diagnose ADHD. As in many clinical problems, history taking is the most important aspect that might raise the suspicion of a provisional diagnosis. The core symptoms of ADHD include inattention, hyperactivity and impulsivity. These are usually presented as a spectrum and the child can be only allocated in one side or another. In primary school children complaints of inattentive restlessness claimed to be as high as 20% while pure hyperkinetic symptoms were merely given in 1-2% of the situations (Williams, 1995).

There are two widely used criteria to diagnose ADHD based either on The International Statistical Classification of Diseases and Related Health Problems 10th Revision, ICD-10 (WHO, 1993), or the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition, DSM-IV (American Psychiatric Association, 1994). Making decision based on the criteria is easier in children over four years old, while in children of three years and below, over activity and short attention span does not necessary mean that they have ADHD (Quentin, 2001).

Although DSM-IV and ICD-10 have many similarities, their predictive values can vary a lot. In one recent study, designed to examine the predictive validity of each of them, ICD-10 gave the prevalence of ADHD (hyperkinetic disorder) as 11.0% of study's population while DSM-IV gave a prevalence of 47.7% for ADHD the combined subtype, DSM-IV pointed the rates of ADHD-Hyperactivity/Impulsivity subtype and ADHD-inattentive subtype at 14.3% and 27.0% consecutively (Lee, 2008).

NICE reported that the receiver operating characteristic (ROC) curve showed that DSM-IV criteria seem to be more inclusive and way more sensitive than ICD-10 (NICE, 2008), which can be explained by two main differences. Firstly, in DSM-IV, both hyperactivity and impulsivity are joined in one group; and secondly the child will be labelled as ADHD whether he has just hyperactivity and impulsivity subtype or attention deficit subtype only.

In the first difference it is clearly obvious that by joining the hyperactivity and impulsivity it become easier to fulfil one criterion with six out of nine symptoms when compared to satisfying the two criteria for each hyperactivity and impulsivity separately, but the second difference usually plays the most significant role (Quentin, 2001).

Further differences can be identified between these two systems of criteria. While ICD-10 is an exclusive grouping system, it does not allow multiple diagnoses, and it contains a detached category of the Hyperkinetic Conduct Disorder. DSM-IV in the other hand allows multiple diagnoses with co-morbid disorders like Conduct Disorder, and this fact has significant implications for prevalence studies. Copies of DSM-IV and ICD-10 of ADHD as in (DSM-IV) or hyperactive disorder as in (ICD-10) can be found in Appendices (1 and 2) respectively.

MATERIALS AND METHODS

Methodology

Setting

In primary health care clinics affiliated to Riyadh Military Hospital, child and adolescent mental health services are managed in the same setting with all the other primary care services for all age groups. There is no specialized team for this type of service and patient with ADHD related symptoms are assessed by the family physicians, based on DSM-IV criteria. If ADHD diagnosis is suspected, the hospital policy imposes that the child must be referred directly to the psychiatry department-child psychiatry team for further assessment. This is in fact leads to delay in formulating the diagnosis and in managing the cases properly.

The department's decision makers are aware of these draw backs and there is a great enthusiasm to develop a child and adolescent mental health team in order to provide better services for the clients and to improve the quality of care provided by the department.

Subjects

The target population is physicians working in the Family and Community Medicine Department affiliated to Riyadh Military Hospital.

Research Design

This is a cross-sectional descriptive study with a pre-validated questionnaire developed by Evaluation and Program Improvement in Atlanta (2007).

Sample Size / Participants

A medical statistician was consulted regarding the effective sample size, and he advised for a minimum of 124 physicians to be included for this study. Sample size was calculated considering that the power of the study is 0.90 (90%), significance level of 0.05 (5.0%), with 95% (0.95) confidence level.

Recruitment / Administration of Survey

183 questionnaires were sent to all the physicians working in the Family and Community Medicine Department affiliated to Riyadh Military Hospital to cover for any dropout rate. All the questionnaires were sent through the physicians' mail pox in the department's mailing room. Physicians were informed in the first page about the purpose of the study and that their participation is completely voluntary, their opinions are highly valuable to this study and their responses will be anonymous and strictly confidential. They were also directed that their responses must reflect their practice over the past 12 months. They were asked to fill in the questionnaires and put them in a study box that was located in the lecture hall of the department. This box was locked and has only one small opening to accommodate the returned questionnaires. The questionnaire was also attached with a letter from the director of the department indicating the importance of the study and encouraging the physicians to make every possible effort to participate in this study.

None respondents were followed up through sending a letter to all physicians through the director of the department to remind them about the importance of the study and its value in helping them to improve the quality of care provided to their patients.

Questionnaire

The data were collected through a self-administered pre-validated questionnaire that is consisted of two main parts. The information sought in the first part included socio-demographic data in form of age,

gender, job title, and years of experience. Furthermore, the second part of the questionnaire included two sections as follow:

a. Section 1: Knowledge Survey

A 66-item knowledge questionnaire based on the Centre for Evaluation and Program Improvement in Atlanta (2007) "ADHD project final report". These items were designed to address the American Academy of Paediatrics guidelines and recommendations about ADHD, which was selected because these guidelines are intended for primary care physicians and how can they diagnose and treat children with ADHD without major co-morbidity. This is why these guidelines were chosen to represent the gold standard in this section. Specific items addressed issues such as screening for DSM-IV criteria for ADHD, co-morbid conditions, behaviour therapy and medication management for ADHD. The majority of items are rated true, false, or do not know. Two items were rated on a 4-point scale with one correct answer. High score indicate more knowledge about the assessment and management of ADHD.

b. Section 2: Perceived Barrier Survey

Physicians' perceived barriers to better ADHD care will be assessed using a 12-item Perceived Barriers Questionnaire (Centre for Evaluation and Program Improvement, 2007). Using a five point "Likert-type rating" scale, various internal (e.g., insufficient knowledge and skills) and external (e.g., not enough time) barriers to better ADHD care will be assessed.

Two questions about reimbursement rates and confusion on how to bill for assessing and/or treating ADHD were omitted because they are not applicable to the setting of the current study, as the service in Riyadh Military Hospital is governmental and completely free for all the clients. Thus, Physicians' perceived barriers ended by 10 exploratory items only. Physicians will responses on a 5-point scale (0-4 scale), with higher scores indicating a higher level of perceived barriers. Therefore, the questionnaire was revalidated and the internal consistency was checked using the Cronbach's Alpha coefficient that came to be 0.92 (see Results section).

Scoring System

As the questionnaire carried out three sections in the second part, each section had its own scoring system accordingly. In the knowledge survey (Centre for Evaluation and Program Improvement, 2007), the correct answers will be marked and the percentage will be calculated for each respondent. Higher scores will indicate more knowledge about the assessment and management of ADHD. The average of the overall knowledge of the participants about ADHD will be identified. Furthermore the knowledge score for participants were subdivided into three parts: Poor (less than 50%), Fair (50-69%), and Good (70% or more).

In the perceived barrier survey (Centre for Evaluation and Program Improvement, 2007), the items will be scored on a 5-point scale 0, 1, 2, 3, and 4 for the responses never, rarely, sometimes, usually, and always, respectively. For each perceived barrier to better ADHD care, the scores will summed and the total will divided by the number of the respondents, giving a mean score for that perceived barrier.

Statistical Analysis

Data were analysed with the help of a competent clinical statistician using Epi-Info 6.04 and SPSS 14.0 statistical software packages.

RESULTS AND DISCUSSION

Results

Statistical Analysis

The questionnaires were checked manually for any missing data before they were entered into a Microsoft Excel 2003 spreadsheet. As there were no missing data all the questionnaires were included in the analysis of the current study. Later on data entry was checked for accuracy by examining frequencies for incorrect or unexpected values; there was none.

Data analysis was done using Epi-Info 6.04 and SPSS 14.0 statistical software packages. Data are presented using descriptive statistics in the form of frequencies and percentages for qualitative variables

(Including knowledge scores), and means and standard deviations for quantitative variables (Including the socio-demographic data).

The reliability of the questionnaire was assessed by checking internal consistency with Cronbach's Alpha coefficient. The Cronbach's alpha is used to check the reliability of a questionnaire and to determine the extent to which the items in the questionnaire are related to each other.

The Cronbach's alpha is used as well to see if there are items that should be excluded from the scale. It can also be used to get an overall index of the repeatability or internal consistency of the scale as a whole (Gliem *et al.,* 2003).

As the Student's t-tests is statistically used to find out whether the mean of a normally distributed population has a value specified in a null hypothesis and it should only be used if the variances of the two populations/groups means are set in a comparison (McDonald, 2009). While the analysis of variance (ANOVA) test is a collection of statistical models, and their associated procedures, in which the observed variance in a particular variable is partitioned into components attributable to different sources of variation. The ANOVA test is helpful because it possesses an advantage over t-test because it can be used to compare more than two means (Kutner, 2005).

The Quantitative continuous data in the current study were compared using Student t-test in case of comparisons between two independent groups, and one-way analysis of variance test (ANOVA) for multiple group comparisons. When normal distribution of the data could not be assumed, the non-parametric Mann-Whitney test was used instead. Qualitative variables were compared using chi-square test.

Correlation and dependence analysis aims to determine any statistical relationships between two or more random variables or observed data values. Pearson correlation analysis was used in this study for assessment of the inter-relationships among knowledge's score and age.

Aiming to identify the independent predictors of the knowledge about ADHD, stepwise backward linear regression analysis was used. Statistical significance was considered at p-value <0.05.

Descriptive Statistics

Out of 183 physicians working in the Family and community medicine department at RMH only 141 were included in the study, and by the end of the study 130 physicians (92.2%) completed the questionnaires and were included in the statistical analysis. 42 physicians were excluded because they were temporarily away during the study period; 23 of the department's physicians were in their annual leaves, 12 were assigned in military escort missions outside the department, 7 were in long study leave (scholarship), and 2 were in maternity leave.

Due to the exclusion of two questions from the original pre-validated questionnaire in the barriers section in the questionnaire used in this study, the internal reliability of was reassessed for this section and the Cronbach's alpha was calculated and came to be 0.92.

As Cronbach's alpha will generally increase as the inter-correlations among test items increase, and is thus known as an internal consistency estimate of reliability of test scores it was widely accepted by statisticians that Cronbach's alpha of 0.70 or more is a strong indicator for inter-correlation consistency (Zinbarg *et al.,* 2005).

Study Population Characteristics

Table 1 presents the demographic characteristics of the study population. Of the 130 respondents, 78 (60.0%) physicians were male and 52 (40.0%) were female. The mean age of the respondents was around thirty seven years. Physicians were investigated in four age groups: <30 years, n=46 (35.4%); 30-39, n=46 (35.4%); 40-49, n=28 (21.5%); 50 and over, n=10 (7.7%). Concerning job title, 4 (3.1%) of the respondents were Senior House Officers (SHOs), 36 (27.7%) were Residents, 43 (33.1%) were Registrars, 22 (16.9%) were Senior Registrars, and 25 (19.2%) were consultants. While most of the respondents, n=63 (47.7%), graduated 5-20 years ago, 42 physicians (32.3%) graduated within the last five years, only 25 (19.2%) graduated more than 20 years ago.

Table 1: Socio-demographic of 130 participant Physicians

Demographic	Number	%
Gender		
Male	78	60.0
Female	52	40.0
Age Group (years)		
<30	46	35.4
30-39	46	35.4
40-49	28	21.5
50+	10	7.7
Job Title		
SHO	4	3.1
Resident	36	27.7
Registrar	43	33.1
Senior Registrar	22	16.9
Consultant	25	19.2
Years since Graduation		
5 years	42	32.3
5-10 years	23	17.7
10-15 years	27	20.8
15-20 years	13	10.0
>20 years	25	19.2

Knowledge of ADHD amongst Physicians

The average score of the overall knowledge was 52.1 % with a minimum score of 0.0% and a maximum of 72%. Only 8.0% of the participants had good knowledge about ADHD (knowledge score of 70% or more), while the knowledge of 34% of them was poor (knowledge score less than 50%). Most of the participants' knowledge was in the fair zone (knowledge score 50-69%), see figure-1.

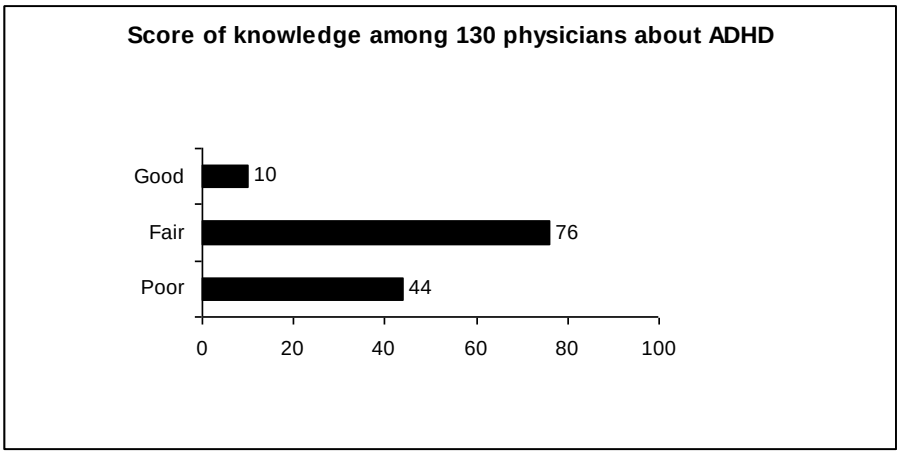

Figure 1: The Knowledge Score Distribution among 130 Physicians

Table 2 illustrates a comparison of the knowledge scores between the physicians based on their socio-demographic characteristics. Analysis of variance found statistically significant differences in knowledge scores by job title (P-value: 0.009). The mean score of knowledge was significantly higher among consultants.

Table 2: Comparison of the Knowledge Scores between the Physicians Based on their Socio-Demographic Characteristics

Characteristics		Means ± SD	Test	P-Value
Gender			T- test	
	Male	34.45±11.82	-0.082	0.935
	Female	34.29±9.45		
Job Title			F-test	
	SHO	30.00±7.02		
	Resident	30.02±11.41		
	Registrar	34.42±11.43	3.479	0.009
	Senior Registrar	34.32±11.01		
	Consultant	49.92±6.62		
Years since Graduation			F-test	
	5 years	31.69±11.50		
	5-10 years	34.10±9.47		
	10-15 years	35.74±9.41	0.994	0.413
	15-20 years	36.54±8.90		
	>20 years	35.80±13.23		
Age Group			F-test	
	<30	31.13±11.23		
	31-40	35.78±8.94	2.231	0.088
	41-50	36.2±9.89		
	51+	36.1±17.10		

While 35.4% of physicians knew that there three subtypes of ADHD, only 38.6% of the physicians were aware of the diagnostic criteria of ADHD.

Although most physicians (85.0%) understood that educating parents about the chronic nature of ADHD is a crucial part in the management plan only few of them (9.0%) believed that the management plan should be developed by the physician, parents and patient working together (figure 2).

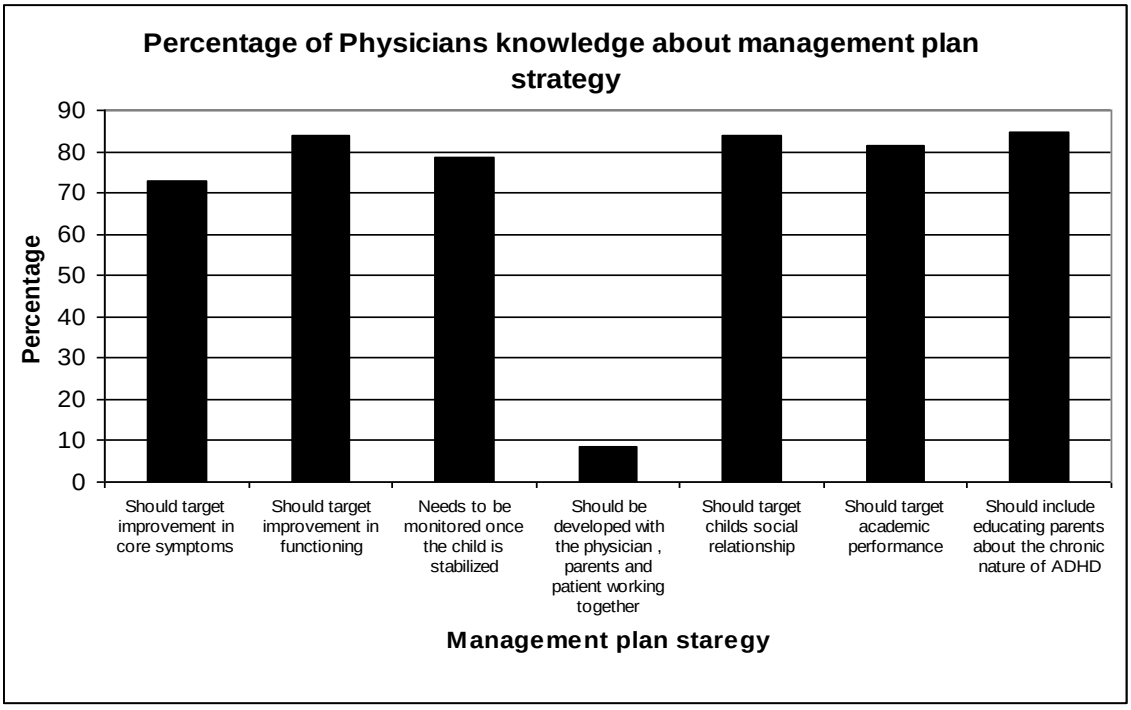

Figure 2: Percentage of Physicians' Knowledge about the Management Plan Strategy

Table 3 shows the knowledge level about the use of stimulants' therapy among the participants. 77.0% of the participants acknowledged that the best dose for stimulant medication is achieved when symptoms are eliminated to a maximal degree with minimal side effects, but only 8.0% were aware that during medication titration weekly feedback from parents is recommended.

Barriers Section

Results suggest that individual physicians vary widely in their perception of barriers to providing better ADHD care (see Table 4).

Although the mean score was 23.02 (±9.49), indicating that the average amount of the all over barriers endorsed is about 57.5% (32.5%-82.5%), thus, some physicians perceive very few barriers preventing them from providing better care while others perceive many barriers.

Table 5 shows average score of each of the barriers to a better ADHD care in as perceived by the physicians participated in this study.

Lack of enough time during the clinic visit to address ADHD and the fact that other medical/behavioral conditions take priority over ADHD were seen as the most obstacle against better ADHD care (78.8% and 73.8% respectively), while the lack of personal/professional interest in ADHD and the unavailability of qualified mental health providers were the least (43.7% and 44.6% respectively).

The best models predicting knowledge scores from socio-demographic characteristics were identified using multiple linear regression analysis.

For the knowledge score, as a dependent variable, the statistically significant independent predictors were job title and respondent's age (positive predictors). The knowledge score was higher among consultants and old participants, figures-3&4.

Table 3: Score of Knowledge about Stimulants Therapy in ADHD

Question	**Correct Response** (%)
a. Short and long-acting methylphenidate, short- and long-acting Dexedrin and mixed amphetamine salts can equally be recommended for treatment.	29.0
b. When treating with stimulants, serologic or haematological monitoring should be done.	18.0
c. Adverse effects of stimulants are usually mild, short lived and easily treated by adjusting dose or schedule of medication.	45.0
d. Permanent slowing of growth velocity is a side effect when children are treated with stimulant medications.	27.0
e. Pemoline should not be a first line treatment because of potential fatal hepatotoxicity.	19.0
f. Desipramine and Bupropion are supported for treating ADHD but only after two trials of stimulant medication have failed.	23.0
g. During medication titration weekly feedback from parents is recommended.	8.0
h. During medication titration weekly feedback from classroom teacher(s) is recommended.	10.0
i. The best dose for stimulant medication is achieved when symptoms are eliminated to a maximal degree with minimal side effects.	77.0
j. Children who are treated with stimulants usually have the best response to the first dose prescribed.	37.0
k. Behavioural therapy may be needed to manage core ADHD symptoms but is not helpful for co-occurring symptoms.	28.0
l. Monitoring long-term treatment requires direct input from teachers.	64.0
m. Since the response to medication is stable during school aged years there is no need to continually reassess the child.	60.0
n. An office visits every 12 months is adequate for monitoring after a child has stabilized.	25.0

Table 4: Score of Overall Perceived Barriers to Better ADHD Care among Physicians

Score of the Overall Perceived Barrier to Better ADHD Care among Physicians					
Characteristics	**Scale**	**No. of questions**	**Means±SD**	**Percentage**	**Min/Max**
All over perceived Barriers Score	0-4	10	23.02±9.49	0/40	0/40

Table 5: Score of Individual Perceived Barriers to Better ADHD Care among Physicians

Perceived Barriers	**Score (%)**
a. No enough time during the clinic visit to address ADHD	78.8
b. Other medical/behavioural conditions take priority over ADHD	73.8
c. A lack of sound scientific evidence to support clinical decisions	59.2
f. Few qualified mental health providers available for consultations	44.6
g. My office staff is uncomfortable dealing with ADHD	57.9
h. Lack of personal/professional interest in ADHD	43.7
i. Insufficient personal/professional knowledge and skills about ADHD	49.3
j. Confusion about how to use behavioural rating scales	63.1
k. Lack of practical tools to assess ADHD	66.9
l. Lack of practical tools to treat ADHD	66.5

Figure 3: The Linear Regression Analysis Models for Knowledge Score and Age of the Participant

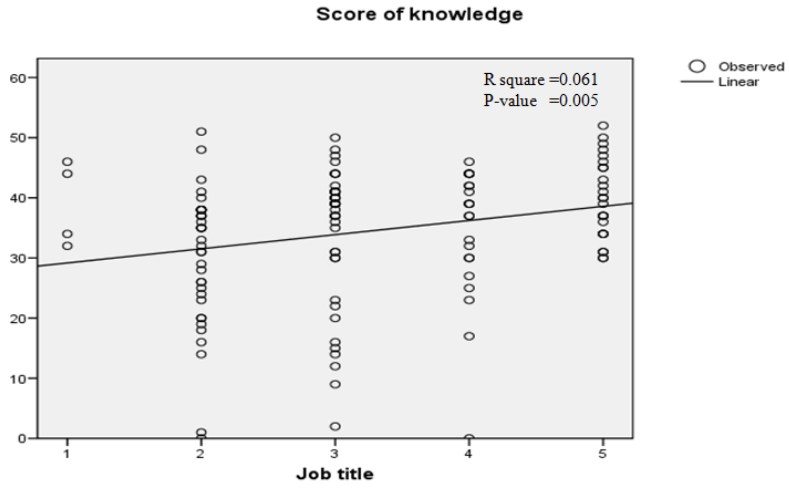

Figure 4: The Linear Regression Analysis Models for Knowledge Score and Age of the Participant

Discussion

This study examined the overall knowledge of family physicians about ADHD. Physicians' characteristics were also examined as possible predictors of this knowledge. Physicians' knowledge about diagnostic criteria, behavioural techniques and stimulant pharmacotherapy were tested. The perceived barriers, in care delivery from primary care to the child with ADHD and their family, were also assessed.

The findings of this study suggest that GPs do not feel equipped to diagnose or manage ADHD even though the American Academy of Paediatrics (2000) the American Academy of Child and Adolescent Psychiatry (2007), The National Institute for Health and Clinical Excellence (2008), and Scottish Intercollegiate Guidelines Network (2009) state that they should provide care for affected children.

Although family physicians are expected to have adequate knowledge to make probable diagnosis of ADHD (Kelly and Aylward, 2005), this study has shown that overall knowledge of family physicians in about ADHD was relatively poor (52.1%) when compared to 64.3% in Singapore (Lian *et al.*, 2003) and 69.1% in Pakistan (Jawaid *et al.*, 2008). This could be due to the fact that the family physicians in general receive little relevant training in ADHD care (Camp *et al.*, 1997) and generally, they are not trained in management strategies appropriate to ADHD care, such as family therapy, behavioural therapy or classroom management strategies (Mitchell and Shaw, 2000). From another view within the target population in the current study, even if training was provided physicians' knowledge about ADHD might be affected as they are expected to refer all the suspected cases to the psychiatry department without having them involved in the management or follow up plan. Therefore, they will miss the opportunity to gain knowledge and/or experience in ADHD.

Although the evidence from the literature indicates that the majority of ADHD patients are un-medicated and possibly undiagnosed (Shaw *et al.*, 2003), the participants expressed considerable concern regarding the over diagnosis or misdiagnosis of ADHD. The reason for the belief that ADHD is over diagnosed or misdiagnosed has not been explored in the literature but may be related to physicians' beliefs that children who misbehave are labelled inappropriately with ADHD and treated with stimulants.

In this respect, differentiating between the physicians' understanding of ADHD as a diagnostic category and as a social phenomenon is relevant. The research of ADHD causality and best practice in treatment and management proceeds from the point where subjects have been positively identified as suffering from the disorder. The location of the GPs' perceptions could be described as the social interface of the diagnostic process that precedes the identification of ADHD as a disorder. It is this point of the diagnostic process that the evidence base fails to address. Qualitative research and focus group study design can be of great help toward a deeper understanding of this issue. Themes like ineffective parenting, family dysfunction and attributing medical labels to normal variations of behaviour, can be tackled.

Hence, there is little guidance for individual GPs in the determination of which symptoms are present or whether the symptoms cause 'clinically significant' impairment, the uncertainty that surrounds decision making in this context was reflected in the GPs' positive views toward diagnostic assessment tools and behavioural rating scales. Confusion about how to use behavioural rating scales and the lack of practical tools to assess and/or treat ADHD, were indicated as important barriers to better care of ADHD.

Although the willingness of general practitioners' to diagnose and treat adult ADHD without deferring to a specialist was low when compared with other psychological conditions (e.g. Major depressive disorders and General anxiety disorders), the majority of them reported that they would be more active in diagnosing and treating adult ADHD if they had an easy-to-use, validated screening tool (Alder, 2009).

Such tools might enable a greater sense of certainty in an uncertain situation. For example, the Adult ADHD Self-Report (ASRS) version 1.1 Screener, that uses adult-specific, context-based language to identify adults at risk for ADHD (Alder *et al.*, 2006). It is a self-administered and contains the six symptoms of ADHD psychometrically determined to be most predictive of the disorder (Kessler *et al.*, 2005). It has shown good sensitivity and specificity and has a positive predictive value of 93% (Kessler *et al.*, 2005). It is also available in an 18-item format Checklist, which contains the 18 items corresponding to the adult presentation of ADHD symptoms in the DSM-IV. The Adult ADHD Self-Report (ASRS)

version 1.1 Screener and Symptom Checklist are copyrighted by the World Health Organization and are available at no cost on the Internet. Thus it could be a useful tool widely accessible to all physicians.

As behavioural assessment tools of ADHD are based on the parents, teachers and/or self report, then Arabic versions need to be developed and validated to simplify the diagnostic and assessment processes. Thus, there will be a uniform objective translation of these tools instead of the current situation where physicians have to translate the English version of these tools and verbally to the parents during the consultation.

Treating youths with ADHD can be an involved process that requires frequent follow-ups, collateral contacts and modifying treatment over time (NICE, 2008). This work can be time consuming and may not yield high reimbursements. On the other hand, some physicians may be less inclined to work with this population, given the behavioural problems that often coincide with ADHD (Dew-Reeves, 2008).

Participants of this study expressed low levels of interest in becoming highly involved in ADHD care. The majority of the study population reported that they are uncomfortable dealing with ADHD and that ADHD should be managed by qualified mental health providers. This result is similar to findings from other studies from Pakistan (Jawaid, 2008), Iran (Ghanizadeh, 2010), and Australia (Shaw, 2003).

Concerns about diagnostic complexity, time constraints, insufficient education and training about ADHD, and concerns regarding misuse and diversion of stimulant medications were the reasons cited for their unwillingness to be involved. In fact, concerns about the illegitimate use of stimulant medication contribute to GPs' reluctance to prescribe this medication.

While educational strategies could redress the education and training issues, the diagnostic complexity of ADHD and time limitation for comprehensive assessment suggest that education and training, per se, may have limited impact on increasing GP involvement in management.

Recommendations

Based on the results of this study the following are recommended:

- Communicating the findings of this study to the decision makers in RMH.
- Senior managers in RMH should demonstrate their commitment to help and support patient with ADHD and their families.
- A specialized child and adolescent mental health care unite that involve a multi-disciplinary team consisting from Child and adolescent mental health specialist, Child & adolescent psychiatrist, Behavioural therapist, Play therapist, Social worker.
- Possible solutions for the barriers toward better ADHD care should be discussed with the physicians using focus groups.
- Identifying and developing the competencies needed to manage ADHD in general practice.
- To promote awareness for child and adolescent mental health problems.
- To identify the prevalence of ADHD and other child and adolescent mental health problems.
- To screen for ADHD and other child and adolescent mental health problems.
- To expose and train Saudi board training program residents in the family and community department to the common child and adolescent mental health problems.

While strength of this study was the high response rate (92.2%), which enhances the validity of its results, a potential limitation is the language barrier because native language of the majority of physicians included in the study is not English. This drawback can be avoided in the future studies by using validated questionnaires of different languages. A self-administered questionnaire was used to collect data in this study. There are two advantages of using this type of questionnaire. First, it can be administered to a larger number of people with less cost. Second, a questionnaire allows information to be collected in a standardized way – more so than for example, interviews. Third the behaviour of the interviewer, who need not even be present, will not directly influence the subject's response to any question. Focus group and/structured interviews might give a deeper understanding of the physicians perceived barriers to a better ADHD care. This might be more costly compared with the self-administered questionnaire especially if dealing with a large number of subjects with no financial support to carry out the study.

As caring of ADHD patients needs a multi-disciplinary team, similar studies should be done on a wider scale that includes more physicians and other health professionals such as nurses or health educators as well as psychologist and psychiatrists. In summary, this study was meant to assess the knowledge of Riyadh Military Hospital (RMH) family physicians about ADHD and to identify the perceived barriers in delivery of care from primary care to the child with ADHD and their family through self-administered questionnaires. The findings of this study suggest that family physicians do not feel equipped to diagnose and/or manage patients with ADHD. The development of a child and adolescent mental health team can provide a secure environment for dealing with ADHD patients in the community and support the family physicians in their practice by providing the proper education and training.
Further research is recommended to evaluate the effectiveness of the recommendations if undertaken by the management, to see if they have improved the care to ADHD patients.

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