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Original Article

AN EXAMINATION OF AUSTRALIAN GENERAL PRACTITIONERS' KNOWLEDGE, ATTITUDES AND PRACTICES IN RELATION TO SLEEP DISORDERS

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Conflict of interest: None.

ABSTRACT
Background: Sleep disorders represent an under-recognised public health problem and are reported to be under-diagnosed in general practices.
Aims: To examine general practitioners' (GPs) attitude, knowledge and practice behaviour and identify barriers to detection, diagnosis and treatment of sleep disorders encountered in the Australian primary care setting.
Method: Using mixed methods, quantitative data from the Dartmouth Sleep Knowledge Questionnaire (DSKQ) were analysed using MS Excel 2007. Qualitative data were obtained from one focus group and eight interviews. Data were thematically analysed.
Results: 15 GPs participated; seven in a focus group and eight in interviews. Scores from DSKQ suggest gaps in GPs' knowledge. Qualitative analysis revealed that patients frequently presented with sleep disorders underpinned by mental health disorders. GPs agreed that prescribing pharmacological interventions was undesirable and behavioural interventions were preferred. Barriers included limited training for GPs, lack of resources, patient expectations and willingness to engage in lifestyle changes, and consultation time constraints.
Discussion: Greater flexibility to investigate sleep related problems within the standard consultation and improved access to educational activities could assist GPs. Patient factors, such as adherence to management strategies, are paramount to successful management of sleep disorders; however, these obstacles to clinical practice may be difficult to overcome.
Conclusion: Providing education for GPs about sleep disorders, greater flexibility within consultations may improve patient care and patient engagement in management strategies may assist, yet a critical success factor in disease management includes patient engagement in management strategies.
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INTRODUCTION

Sleep has a vital role in optimal human functioning.[1] Sleep dysfunction is associated with diminished cognitive and motor performance, decreased health status, poor mental health and quality of life, and increased morbidity and mortality.[2] Over 1.2 million Australians suffer from a sleep disorder, representing an under-recognised public health problem[3,4] including driver fatigue which contributes to more than 25% of all road crashes in Victoria, Australia.[5] Sleep disorders are classified into four major groups.[6] This study focuses on Obstructive Sleep Apnoea (OSA) and Insomnia. OSA, characterised by "repetitive episodes of upper airway obstruction that occur during sleep, usually associated with a reduction in blood oxygen saturation",[6] has been estimated to have a prevalence between 9-24% in the general population. Insomnias are characterised by dissatisfaction with quality of sleep and/or insufficient sleep quantity and has a prevalence of 6-15%.[7]

Patients with a sleep problems approach their general practitioners (GPs),[3] but in more than 50% of cases, sleep disorders are not diagnosed by GPs[8] resulting in sub-optimal management. For example, one American study found that of 150 patients attending a sleep laboratory, 30% suffered from undiagnosed OSA, and had been prescribed sedative medications, increasing their risk of motor vehicle accidents.[9] The American Driver Fitness Medical Guidelines and the

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Australian Medical Standards for Licensing both emphasize that drivers with OSA have a greater motor vehicle crash risk than individuals without OSA, and individuals with OSA become unsafe soon after cessation of continuous positive airway pressure (CPAP) due to non-compliance.[10,11] Hence, it appears that under-diagnosis as well as inappropriate management of sleep disorders compound the associated substantial health and safety consequences.

In general practice, insomnia is predominantly managed with pharmacological interventions with some patients referred to a specialist and few to allied health professionals.[12] Behavioural approaches appear to be under-utilised for a variety of reasons including a lack of knowledge[13] and training[14] despite training being successful in increasing identification and diagnosis rates.[8]

While efforts to improve detection, diagnosis and management of OSA and insomnia in primary care are needed, few studies have examined GPs' attitudes, knowledge and clinical practices of sleep disorders. Examining such factors will offer a chance to identify gaps in GPs training and educational opportunities and barriers GPs may face in their day-to-day clinical practice. This pilot study aimed to examine GPs' attitudes, knowledge and clinical practice behaviours as well as identify factors influencing detection, diagnosis and treatment of OSA and insomnia in Australian primary care setting using qualitative and quantitative methods.

METHODS

Mixed method

Quantitative data included demographic information and the Dartmouth Sleep Knowledge Questionnaire (DSKQ). Qualitative data were collected through one focus group and eight interviews.

Participants

A convenience sample was recruited using two methods: a letter of invitation circulated through the Monash University networks, and advertisements which were placed in metropolitan-based General Practice Divisions from September 2009 to February 2010. 15 GPs participated; seven in a focus group and eight in face-to-face interviews which was all conducted in Melbourne, Victoria.

Data collection and tools

GP demographic data were collected using a brief demographic questionnaire. In addition, the 24-item multiple-choice DSKQ was used to assess GPs' knowledge of sleep disorders and management.[15] DSKQ is a validated questionnaire developed for the purpose of assessing effectiveness of curriculum development and educational interventions in sleep medicine. Based on current literature and expert advice, a semi-structured interview schedule was developed with six sub-headings and was used for the focus group and interviews (Table 1). The focus group was led by an experienced moderator and all interviews were conducted by one member of the research team. All were conducted between October 2009 and April 2010, audio-taped and transcribed verbatim.

Table 1: Summary of interview protocol

Category	Summary of semi-structured interview schedule
General	• Frequency and types of sleep disorders seen • Patient groups
Attitudes	• GPs attitude towards impact of sleep disorder, self-perceived skills in assessment and management. • Factors which impact clinical practice behaviours as well as patient factors in relation to sleep disorders • Sources of knowledge
Practices	• Practices relating sleep history • Prescription habits
Insomnia	• Assessment and management practices and preferences • Distinguishing types of insomnia
Obstructive sleep apnoea	• Assessment, management and referral practices
Personal experience	• Impact of personal experience with sleep disorders on clinical practice behaviours

Data analysis

Results from the DSKQ and demographic data were analysed using MS Excel 2007. Data was explored using descriptive statistics. Qualitative data were collated[16] and analysed using thematic analysis, with a constant comparative method.[17] Data were analysed and verified independently by two investigators and emerging themes were compared, discussed until consensus was reached. Themes, supported by key quotes, are used to illustrate the main findings.[18]

Ethics

This study was approved by the Monash University Human Research Ethics Committee. GPs expressing interest in the study were provided with an explanatory statement either via email, fax or post and were encouraged to seek clarification as required from the research team. If GPs wished to participate, they returned written informed consent form to the research team.

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RESULTS

Demographic data: The sample comprised of 15 GPs; nine males (60%) and six females (40%) (M age=53.06, SD=7.96). Participating GPs had been practising for an average of 25.7 years (range=5-40 years). These results concord with the national distribution.[19,20]

Dartmouth Sleep Knowledge Questionnaire

All participants completed the DSKQ, with a maximum score of 24, the average score was M=13.1 (54%) (SD=2.78) (Table 2).

Qualitative findings

1. Knowledge and attitudes about sleep disorders and their management

The majority of GPs described their knowledge as being fair to poor; particularly their knowledge about sleep architecture and physiology was lacking which may affect GPs' ability to identify underlying issue to establish a diagnosis. GPs indicated there was a lack of succinct assessment material available which could improve detection of sleep disorders:
"…I am pretty sure everyone in here can actually ask questions appropriate to find out the person has a sleep problem and probably even detailing you know the magnitude. But I think our problem is often defining, what's the underlying reason for it."

These comments were supported by the results of the DSKQ, which indicated GPs' knowledge of sleep architecture, physiological basis of sleep and more unusual sleep dysfunctions was limited.

GPs were aware of the risks associated with pharmacological medication use to manage insomnia and agreed that prescribing benzodiazepines was undesirable due to risks including addiction, abuse, falls and suicide, particularly in the elderly:
"...and you have to be very careful, because the risk of suicide is actually quite significant."

Table 2: Percentage of correct answers on DSKQ item (n=15)

Question	Correct answer	Percentage correct
REM behaviour disorder is primarily associated with which of the following conditions?	Neuropathology	46.1
Cataplexy is best described by which of the following?	Loss of muscle tone induced by emotion	85.7
Which of the following conditions is most commonly associated with excessive daytime sleepiness?	Obstructive sleep apnoea	93.3
Optimal long-term treatment outcomes for chronic, primary insomnia are achieved with which of the following therapies?	Cognitive-behavioural therapy	85.7
A polysomnogram (sleep study) is required for the diagnosis of which of the following sleep disorders?	Obstructive sleep apnoea	93.3
Acute ingestion of alcohol just prior to sleep onset has the following effect:	Increases total sleep time for the first half of the night and decreases total sleep time for the second half of the night	57.1
Which of the following is the recommended treatment for moderate to severe obstructive sleep apnoea?	Nasal continuous positive airway pressure	100.0
Initial evaluation of a patient with an insomnia complaint should include which of the following?	Sleep Log	80.0
Major depressive disorder is primarily associated with which of the following sleep disturbances?	Hypersomnia/Insomnia	92.3
The standard objective measure of daytime sleepiness is:	Multiple Sleep Latency Test	7.6

A 45-year-old woman presents complaining of symptoms consistent with restless leg syndrome. These symptoms interfere with her ability to initiate and maintain sleep most nights. She also has complaints of excessive daytime sleepiness, despite sleeping 8-9 hours per night, and finds herself routinely dozing off unintentionally while reading. Which of the following is the most appropriate pharmacological treatment for her current symptoms?	Low dose sedating antidepressant at bedtime	85.7
REM sleep normally begins:	About 90 minutes after sleep onset	40.0
A normal sleeper is aroused briefly after every minute of sleep for 2 consecutive nights. Even with this manipulation, the subject averages 6 hours of sleep between arousals. What effect would these arousals have on performance and subjective sleepiness?	Decrements equal to someone with total sleep deprivation of 40–64 hours.	66.6
The locus of the primary (or dominant) circadian clock is	Suprachiasmatic nucleus	22.2
An individual is being assessed for complaints of fatigue. A Multiple Sleep Latency Test (MSLT) is administered and the patient produces an average sleep onset latency of 12 minutes. What is the best interpretation of this result?	The patient is moderately sleepy	66.6
A 17-year-old male presents with difficulty falling asleep until 3 am and difficulty awakening for school at 7 am. He sleeps normally from 3 am until noon, when permitted, and then has normal alertness during waking hours He is most likely experiencing which of the following?	Delayed sleep phase syndrome	50.0
During a routine paediatric clinic visit, a mother reports that she has been finding her 7-year-old son up and walking around at night. These episodes occur 1-2 hours after the patient goes to bed. Although the patient may answer his mother if she talks to him, he has no recollection of the event the next day. Which of the following sleep-wake stages is this disturbance most likely to arise from?	Stage 3/4	36.3
Disorders commonly presenting with excessive daytime sleepiness include all of the following except:	Acute sleep deprivation	18.1
Obstructive sleep apnoea has been associated with an increased risk of developing which of the following:	Alzheimer's Disease	90.9
A 28-year-old woman with a history of depression and anxiety undergoes polysomnography as part of a research study examining sleep and depression. She is currently taking Lorazepam 0.5 mg TID. Benzodiazepines have been associated with which effect on sleep architecture?	Increase in sleep spindles	27.2
Which of the following statements best describes individual sleep need?	Sleep need is fixed at about 7.5–8 hours through adult life	69.2
Which of the following most commonly characterizes sleep in older individuals?	The ability to maintain sleep declines	64.2
The leading cause of chronic insomnia is.	Major depressive disorder	53.8
All of the following statements regarding sleep-wake cycle/circadian rhythm are true except	Forward shift rotations (day-evening-night) produce greatest sleep disruption	46.1

Most GPs were aware of behavioural and psychological interventions. This was also reflected in DSKQ results, with 85% of GPs correctly responding to items about behavioural management of insomnia:
"...yeah. We will often go through all those things (stress management, relaxation, CBT) with the sleep. Because there are as you know all those things we have mentioned, there are actually sheets you can give them with all those things. So they know what they are when they go home."

Despite high scores on the DSKQ relating to OSA, several GPs reported they felt they were not well informed about OSA:
"...I agree with you entirely because when I went through medicine, we never got taught anything really about sleep apnoea or anything."

One GP stated that drug companies have no interest in funding education relating to OSA as there is no financial gain.

GPs agreed that sleep disorders causes significant impediments to individuals, nonetheless, two-thirds of the GPs reported they did not routinely initiate discussions about sleep during the consultation. Some stated that enquiries would be made during a general health check; most indicated that sleep would be addressed if sleep was the presenting problem, if triggered by symptoms, or if sleep disorders had been identified in past consultations:
"...the theoretical answer is 'I'm sure it's quite important'; the practical answer is 'I don't do it routinely'. I would ask it whenever there's any question in my head about those other issues, about snoring, about sleep apnoea, about depression, about using HRT for hot flushes. If they come in with a sore shoulder, I certainly don't ask."

Most GPs agreed that many sleep problems were underpinned by mental health issues such as depression, and life stressors such as family, bereavement, and work:
"…very rarely is it just a sleep problem. Often it would be psychiatric symptoms of one kind or another. So, there may be a degree of mood disorder, anxiety, life stresses, not necessarily diagnosable as a syndrome."

2. Clinical practices in managing sleep disorders

2.1 Presentation and assessment

The majority reported having between one and ten cases presenting with sleep problems each week. Patients were generally middle-aged or elderly, but children, shift workers and teens were also represented.

When patients present with a sleep related disorder, GPs agreed that a combination of presenting symptoms, the order of symptom presentation and a sleep history would influence whether they thought insomnia was the primary or secondary problem:
"...as far as I'm aware, mainly use history as a guide as to when their symptoms arise, try and get some feeling as to what came first, the insomnia or depression, seeing what the sleep pattern has been from childhood, et cetera. So again, get a gauge as to whether the insomnia appears to be fairly short term, or more like a secondary reaction to an underlying cause."

Generally, the assessment of OSA was based on signs such as obesity, hypertension, snoring, excessive daytime sleepiness as well as risk assessment in some cases:
"(falling asleep at inappropriate times during the day) people do that, you have to wake them up in the waiting room."

2.2 Management

GPs preferred behavioural interventions including sleep hygiene and lifestyle advice to manage sleep symptoms. A few GPs used specific psychological techniques, and others mentioned pharmacological therapies. When treating sleep disorders associated with depression, some preferred prescribing anti-depressants rather than hypnotics. However, patient's expectations influenced several when deciding management interventions:
"...some patients don't want drugs, other patients want drugs or other patients particularly don't want psychological therapy. This means they are a little bit more restricted and we try and work (with) them."

In acute cases such as bereavement, GPs may prescribe hypnotics as a one-off:
"…well, that would be sleep hygiene and also asking about caffeine use and alcohol use as well in the younger age group because that can be a thing that can be a cause of a sleep disturbance, and assess mood and check it's not depression. Then the sleeping tablets would be a last resort."

Most were conservative in prescribing for new and/or younger patients and in most cases, preferred behavioural interventions, for both young and elderly patients:
"…well, I always try the behavioural first."

When managing elderly patients, GPs provided advice about risks associated with benzodiazepines, however, most expressed leniency regarding writing repeats as withdrawal symptoms may cause suffering and impact on quality of life:
"(so you feel well there's no point in taking them off it)…we always talk about the side effects of them (prescribing medication) and as long as there hasn't been an increased use and they're not depressed and not drinking and it's not going to interact with any of their medications."

"…at the end of the day, the elderly, I find, are more interested in the quality of life rather than the quantity and therefore I tend to be a bit; I am very careful with giving Benzos but on the other hand, you sort of tend to be a bit more; the attitude is to make them comfortable. A bit more lenient yeah."

When managing OSA, all GPs stated they would give lifestyle advice such as losing weight or reducing alcohol intake, but mainly management strategies are guided by specialists:
"Generally, people would get managed primarily by the sleep physician who's running their sleep study. So, most of the steering I think comes from them and we just facilitate it."

Referral practices varied amongst GPs with some indicating they would rarely refer the patient to psychologists without a suspicion of mental health issues:
"As for insomnia, I find that I don't ever need to refer to a specialist. I somehow manage, like you look for secondary causes and you manage the secondary causes, because a secondary cause could be mental health problems and then you will have to refer for those problems, rather than for insomnia, per say."

Others indicated that they would refer to a psychologist to address sleep problems:
"I might be considering referring someone to a psychologist (for insomnia), rarely to a psychiatrist; it would be more commonly a psychologist and it would often be for a behavioural type program."

Most participating GPs agreed that patients exhibiting signs of OSA would be referred to a sleep clinic for a sleep study:
"If I believe it is sleep apnoea, I don't do any other investigation. I refer them on."

3. Factors influencing GPs' clinical practice

GPs identified a number of factors which influenced their clinical practice behaviours; GP-related factors, patient-related factors and system-related factors.

3.1 GP-related factors

Participating GPs stated their knowledge about sleep physiology and sleep disorders was lacking.
"I think my skills are poor. Apart from being able to provide them with some hypnotics, the other suggestions I've got are pretty minimal."

A few felt their knowledge could be improved if succinct assessment material was available. Journal articles and publications targeted at GPs were the main source of information for most; others had attended seminars and a few used written feedbacks from sleep physicians. Several expressed the desire to engage in further education; however, the limited availability of education activities was also noted.

Personal experience enhanced clinical practice; having personal experience with sleep problems provided insight into the patients' experiences, altered management and added validity to advice:
"…I suppose it's innate isn't it? It probably does. One's own experience in every medical scenario has an influence over how you manage things."

3.2 Patient-related factors

Patients' preparedness to commit to the GP's advice and not anticipate a 'quick fix' was associated with positive treatment outcomes:
"Critically would be their preparedness to say, 'This is not something which has a quick fix, and so I will do some of these long term or difficult things', psychological strategies and so on."

Illiteracy, in older patients was a barrier for some as these patients do not respond well to written material:
"Some of my patients tell me, 'Twenty years painting, no reading'."

Some GPs felt that many patients lacked awareness of sleep problems which in turn, meant that patients do not specifically present with a sleep problem, complicating identification:
"A patient's lack of education, lack of awareness of the issues, and I am unaware of it, then certainly, the general public is aware, so they are not going to present and say I have got restless legs or I have got delayed sleep syndrome or I have got REM abnormal behaviour. So, it is just a lack of general information."

Concern was also expressed for patients who depend on the public health system, as they may not be able to pursue referrals to non-bulk-billing clinical psychologists:
"I would prefer more of these chronic patients to be assessed by clinical psychologists but the patients I send there, reckon they can't afford it. This may or may not be true. But in any case, the clinical psychologist does not bulk-bill. Although it is potentially possible that they could, but yet they don't."

Patients may also struggle to have a sleep study conducted within a reasonable timeframe in the public system, and may not be able to afford to pay for a sleep study in a private facility:
"The patient is still is out of pocket one hundred bucks for a home-study (sleep study), so again, that might exclude some patients."

"Public hospitals, they've got sleep studies but it is a couple of years wait to get in. So, you are a bit restricted."

3.3 System related factors

Time constraints of the standard consultation influences clinical practice behaviours as GPs are renumerated for short consultations and penalised for engaging in longer, more in-depth consultations:
"You're much better off to see six or eight people in an hour for short consults than three for a higher bidding of long consults. We have a bizarre system which pays you much less than doing the job well."

Time constraints also led to discrepancies in clinical practice; some GPs indicated that clinical practice behaviours were guided by time constraints rather than best practice:
"Sometimes I might give them just a one-off supply (of benzodiazepines) depending on time factors, and if I haven't got enough time to deal with it on that first occasion and send them away with some tablets first and then if they need repeats, to then come back and discuss it further."

DISCUSSION

Results from this study are similar to those reported elsewhere;[13] the majority of GPs rated their knowledge of sleep disorders as fair to poor. The results of the DSKQ and qualitative reports suggest that participating GPs appear reasonably confident in identifying and managing typical OSA patients, whereas GPs reported a lack of understanding of the physiological underpinnings for sleep disorders and limited knowledge of less common sleep disorders; results supported by the outcomes of DSKQ. This is not surprising as one barrier identified was a lack available educational material specifically tailored to meet the needs of GPs. In this study, GPs stated that they would welcome educational interventions and materials to improve detection and management. Educational interventions, diagnostic materials and expert support have been shown to increase diagnosis and referrals for OSA.[21]

While GPs acknowledged that sleep problems can cause significant impediments to patients' lives, but would rarely enquire about patients sleep during standard consultations. Sleep disturbances were regularly encountered by the GPs in this study (one to 10 encounters per week), yet it has been estimated that up to 60.6% of primary care patients may experience sleep disturbances, hence, many may remain undiagnosed.[8,22,23]

GPs' time constraints were similarly identified[22] as a barrier which could be overcome by longer consultations.

Patients' health literacy is a factor which could impact of clinical practice behaviours as patients may not recognise the sleep problem, lack the language or communication skills to express symptoms appropriately. Management of insomnia may involve sleep diaries, logs and the use of actigraphy devices and the complexity of appropriately using this material require a reasonable level of literacy. Therefore, improving health literacy has been advocated as one avenue to improve the detection and diagnosis of sleep disorders.[24]

In this study, GPs indicated a reluctance to prescribe pharmacological interventions and expressed preference for non-pharmacological interventions for dyssomnias such as insomnia, with the exception of many elderly patients who have developed a dependency from long term use. Some discrepancies were noted in the results suggesting that, although GPs would prefer to appropriately assess and manage sleep disorders, they are faced with significant system related factors that do not support the GPs. Participating GPs' clinical management of insomnia appear to be in sharp contrast with the reported national prescribing practices of 95.2% of insomnia sufferers being treated with pharmacological interventions; in this study conservative prescribing behaviour was reported.[12] These differences may be attributed to the study's small sample size; further research is required to assess this. GPs would welcome educational interventions and materials to improve the detection and management of patients with sleep disorders.[21]

Some limitations should be noted; the sample size was small and comprised GPs from metropolitan Melbourne only, subsequently, group comparisons could not be made. The DSKQ has not been validated for use with GPs, but no primary care validated instrument was available. Nevertheless, this pilot study aimed at indicating future directions for a more definitive study and potential interventions.

CONCLUSION

The outcomes of this study highlight the need for educational opportunities relating to sleep disorders and potentially further integration of sleep medicine into undergraduate curricular. Such educational opportunities could provide GPs with a deeper understanding of sleep and sleep disorders. However, in order to empower GPs to utilise their skills, it is crucial to consider all factors which impact on clinical practice behaviours, in particular system constraints that are difficult to manipulate. If GPs were empowered to detect, identify and manage sleep disorders, this, in turn, may improve patient health outcomes, increase referral rates and decrease the risks of misdiagnosis.

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