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How training affects Australian paediatricians' management of obesity

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ABSTRACT

Objective: Secondary care could be the optimal sector for managing child and adolescent obesity, given low primary care uptake and limited tertiary services. We aimed to determine Australian paediatricians' self-reported competence and training in managing obesity and, in a linked patient-level audit, whether these predict rates of measurement and obesity diagnosis.

Design, setting and patients: Australian Paediatric Research Network members completed an on-line survey, plus a prospective patient-level audit of up to 100 consecutive consultations over 2 weeks.

Main outcome measures: *Survey:* self-reported competencies, training in and use of clinical skills in obesity and its co-morbidities. *Audit:* paediatricians reported each child's height, weight, age, sex and diagnoses including overweight/obesity.

Results: Of 166 (44.7% response) paediatricians, most felt very/quite competent in assessing (89%) and managing (68%) obesity, but few in making a difference to (20%) obesity or managing hypertension (45%), insulin resistance (32%), fatty liver disease (22%) or dyslipidaemia (21%). The audit of 200 (66.2% response) paediatricians comprised 8,345 patients. On average paediatricians recorded height and weight for 66.5% patients (SD 30.0, range 0-100%). Of the 296 (12.3%) obese by CDC cutpoints, 118 (39.9%) were diagnosed as obese; perceived competence increased the odds of recording this diagnosis but not measurement. Training levels were low, showed little association with measurement or obesity diagnosis, and skills learnt were not routinely used.

Conclusions: There is a clear need for better paediatrician training in obesity management. However, care and outcomes for obese children are unlikely to improve unless effective management models can be operationalised systematically.

INTRODUCTION

In developed countries like Australia, the long-term implications of obesity[1] constitute a major public health challenge for health-care systems and society.[2] While prevention of childhood and adolescent obesity is a priority, effective and accessible treatment is also needed for the 5-10% of individuals who are already obese in childhood or adolescence.[3]

Clinicians caring for children and adolescents must consequently adapt their training and practice to this evolving area of need. In a large recent European study, 52% of overweight children attending specialist clinics had at least one cardio-metabolic risk factor, and 29% and 32% showed signs of fatty liver disease and dyslipidaemia, respectively.[4] Other medical problems like obstructive sleep apnoea, hypertension and orthopaedic problems also are more prevalent in clinically-obese children,[5] as are a range of mental health issues.[6-9]

However, access to treatment and health workforce training remain significant barriers to optimising care for obese children in many countries.[10] In Australia, the handful of specialised paediatric tertiary weight management centres in major cities have long waiting lists and there are relatively few community-based treatment alternatives.[11] Despite nearly a decade of national guidelines for managing childhood obesity,[12] less than 2% of overweight or obese Australian children receive weight management when they attend primary care services.[13]

Low primary care uptake and efficacy[14-17] coupled with very limited tertiary services[11] point to secondary care as possibly the optimal sector for the majority of clinical management of child and adolescent obesity and its complications. In Australia, paediatricians play a central role in assessing and treating chronic conditions such as autism spectrum disorders, asthma and developmental/behavioural issues. However, little is known about how they currently approach obesity, how well-equipped they are to manage obesity and its complications, and whether training and self-perceived competencies in various

aspects of weight management affect the degree to which paediatricians address obesity in their clinical practice.

A further issue is the extent to which secondary-care paediatricians might contribute to obesity-related research. This is crucial given that current treatments have only modest efficacy[18] and remain dominated by expert consensus, e.g.[19]. In a recent national Delphi survey, Australian paediatricians named effective management of childhood obesity and its comorbidities as their foremost clinical research priority,[15] but no studies have examined the kinds of research in which they may be willing to participate.

Therefore, linking national data from (a) an online survey of Australian paediatricians' self-perceived competence and training in managing obesity with (b) a prospective patient-level practice audit, we aimed to determine:

1. General paediatricians' self-reported competence in managing obesity and its comorbidities, and their training in and use of relevant skills/techniques
2. Whether such training predicts self-reported competence in (a) managing obesity and (b) making a difference to an obese child's weight
3. Whether competence and/or training predict the odds of:
 - (a) Children having measurements recorded, and
 - (b) Obese children having a recorded obesity diagnosis in the linked practice audit
4. Interest in participating in childhood obesity research.

METHOD

Design: Established in 2007, the Australian Paediatric Research Network (APRN) is a national network to facilitate multi-site research in non-tertiary paediatric outpatient

settings.[20] This report links obesity-related data from two APRN projects: the 2010 online Multi-Topic Survey[20], and the Children Attending Paediatricians Study (CAPS) audit(21), described below.

Participants: Members were recruited from the 1006 general paediatricians registered in 2007 with their professional body, the Royal Australasian College of Physicians. All Australian states and territories are proportionally represented, and APRN members and non-members are broadly similar other than minor differences in age, sex and practice area type (metropolitan, regional, rural).[15]

Multi-Topic Survey: In late 2009 all members were emailed an invitation to submit possible survey topics to the APRN Steering Group to inform new research in APRN-prioritised areas.[20] Each of the five proposed topics was then developed into a 2-page survey by a small multi-state team of interested paediatricians. Following piloting, these were streamlined and combined into a single online survey. All 372 APRN members registered in April 2010 were eligible and were sent four emails at weekly intervals in March-April 2010: an advance-notice email; an email containing instructions and the online survey link; a reminder; and a final reminder.

The obesity questions (Figure S1, supplementary material available online only) were designed by MW, LB and ED and probed three main areas. Twelve questions probed *self-reported competence* in managing obesity and its comorbidities, with four response options collapsed into ‘not at all/a little’ vs. ‘quite/very’ competent for logistic regression analyses. Six questions probed *self-reported training in and use of skills/techniques* relevant to managing obesity and its comorbidities, each asking whether respondents were trained in the skill/techniques (yes/no) and, if so, whether they used it regularly (yes/no). Finally, paediatricians indicated their *interest in participating in childhood obesity research* (yes/no), and if ‘yes’ their more specific obesity research interests.

Children Attending Paediatricians Study (CAPS): CAPS (described in detail elsewhere[21]) was the first prospective national audit of paediatric practice in secondary care settings, including private consulting rooms, community health centres and hospital outpatient clinics. Briefly, all 302 general paediatricians who had joined the APRN by October 2008 were eligible; subspecialists and those without an outpatient practice were excluded. In October-November 2008, participants prospectively recorded a de-identified information form for each patient seen in their outpatient settings for either 100 consecutive patients or all patients seen over a two-week period, whichever was completed first. The form (Figure S2, supplementary material available online only) was modelled on the Morbidity and Treatment Survey of the Bettering the Evaluation And Care of Health (BEACH) program, a continuous national study of general practice activity in Australia.[22]

We extracted paediatrician-recorded patient height and weight, sex and date of birth and diagnoses/problems for each clinical encounter. Height, weight and resulting BMI (kg/m^2) were standardised to age- and sex-specific z-scores using the CDC 2000 growth reference;[23] all values outside ± 5 SD were considered spurious. We used recommended CDC clinical cut points of BMI $\geq 95^{\text{th}}$ centile for obesity and BMI $\geq 85^{\text{th}}$ and $< 95^{\text{th}}$ centile for overweight,[12] and also described BMI status by International Obesity TaskForce cut points.[24] Paediatricians recorded up to four current diagnoses for each clinical visit, using a list of 60 pre-coded conditions (which included the single diagnosis ‘overweight/obesity’)[21] or by writing the diagnoses in full.

Covariates: *Paediatrician characteristics* from the APRN member database included age group, sex, practice type (community/private/public hospital clinic) and Socio-Economic Indexes For Areas (SEIFA) disadvantage index[13] of practice postcode. SEIFA values are standardised scores by geographic area that, using census data, numerically summarise

Australia social and economic conditions (national mean 1000, SD 100; higher values represent greater advantage). *Child characteristics* were sex and age group.

Statistical analysis: We report Aims 1 and 4 using descriptive statistics. To determine predictors of (a) perceived competence in managing obesity and/or (b) making a difference to weight (Aim 2), we used eight logistic regression models, each adjusted for paediatrician age, sex and disadvantage index of practice postcode. The four predictors were the total (summed) numbers of (a) skills/techniques in which trained; (b) skills/techniques trained in and used regularly; (c) comorbidities the paediatrician felt very or quite confident in managing; and, as a sensitivity analysis, (d) comorbidities the paediatrician felt very confident in managing.

For Aim 3, we merged paediatrician-level self-reported data from the Multi-Topic Survey to individual CAPS records of children ≥ 2 and ≤ 18 years for paediatricians who took part in both surveys. We fitted marginal logistic regression models using Generalised Estimating Equations,[25] which allow for intra-paediatrician correlation of patient outcomes, to examine the predictors of the odds of: (a) having complete height and weight measurements, and (b) an obese child (by diagnosis and/or measurement) being diagnosed as ‘overweight/obese’. Predictors were competence in (a) assessing an obese child; (b) managing obesity; (c) making a difference to child weight; and (d) the individual and summed skills, techniques and comorbidities variables. We adjusted for factors previously found to predict measurement (type of practice, child age group) and diagnosis (child sex and age group).(Campbell et al, under review IJO)

All analyses used Stata, version 11.1 for Windows (Stata, College Station, TX, USA).

Ethics: The Multi-Topic Survey did not require Ethics approval. CAPS was approved by the Royal Children’s Hospital Human Research Ethics Committee (CA28088), with parents assenting verbally to inclusion of their child’s anonymous data.

RESULTS

Participants: Of the 371 APRN members eligible for the Multi-Topic Survey, 180 (48.5%) responded overall and 166 (44.7%) to the obesity section. Of the 302 members eligible for CAPS, 200 (66.2%) participated, reporting on 8,345 patients during the 2-week audit. Survey respondents were more likely to work full time and in community health than non-respondents, but were otherwise similar on most characteristics (Table S3, supplementary material available online only); we have previously reported comparable findings for CAPS.[21]

Self-reported competence (Table 1): While almost all paediatricians felt very or quite competent discussing a child's weight when broached by a parent (mean 2.6 of a possible 3.0), progressively fewer felt competent broaching it themselves (mean 2.4); assessing (mean 2.2) and managing (mean 1.7) obese children; and making a difference to an obese child's weight (mean 1.1). Most felt very/quite competent in managing obstructive sleep apnoea (64%), depression (57%) and bullying (55%), but only 46%, 32%, 22% and 20% in managing obesity-related hypertension, insulin resistance, fatty liver disease and dyslipidaemia respectively. Less than 10% endorsed 'very' confident for each of these.

Training: Table 2 shows that 53% of respondents reported training in *assessing* obesity-related comorbidities, but only 37% in *managing* them. Even fewer were trained in specific management skills – less than 20% for each of the behavioural or formal problem-solving techniques, measuring and interpreting waist circumference, and motivational interviewing. Furthermore, training often did not translate into use: less than 30% of those trained in each skill/technique reported using it, with especially low uptake of formal problem-solving techniques (13% of those trained).

Table 3 shows that, for every additional skill/technique in which a paediatrician was trained, self-reported competence in managing obesity rose by 40% ($p=0.005$) and in making a difference by 50% ($p=0.001$). These same outcomes rose by 60% ($p<0.001$) and 30% ($p=0.007$), respectively, for every additional comorbidity that paediatricians felt very/quite confident in managing. No such associations were evident when considering only the number of skills actually used or the number of comorbidities that paediatricians were very (as opposed to very/quite) confident in managing (see Table 3).

Prospective audit data vs. reported competence, confidence and training (Table 4): 117 paediatricians participated in both the Multi-Topic Survey and CAPS, representing 3,175 encounters with 2-17 year old patients. On average, each paediatrician recorded height and weight data for 66.5% of his/her patients (SD 30.0, range 0-100%). Obesity prevalence in the 2,100 children with valid BMI data was 7.4% using IOTF cutpoints, and 12.3% using CDC cutpoints. Overall, 296 children could be classified as obese by paediatrician diagnosis and/or CDC cutpoints, of whom 118 (39.9%) had a recorded overweight/ obesity diagnosis.

The odds of a child being *measured* were not related to perceived competencies (Table 4), but varied by practice setting (highest in private practice, lowest in community health). Adjusted odds of being measured actually fell as the number of skills in which a paediatrician was trained increased.

In contrast, the odds of an obese child being *diagnosed* increased by 64% and almost two-fold with each increment of competence in assessment and management, respectively. Training did not predict obesity diagnosis (Tables 4 and S4, supplementary material available online only), and perceived competence in making a difference to child weight was associated with neither measurement nor diagnosis.

Interest in participating in obesity research (Table 5) was high. Of the 71% who expressed interest, almost all (88%) were interested in research into obesity itself, and two-

thirds into its comorbidities. The most popular research activities were recruiting to longitudinal studies and shared-care trials with specialist obesity teams.

DISCUSSION

Principal findings: Low rates of diagnosis coupled with a prevalence close to that expected in the general population (7.4% using IOTF cutpoints) suggest that obesity is not a prime reason for referral to Australian paediatricians. Training in specific skills improved self-reported competence and, in turn, slightly higher rates of diagnosis in the practice audit. However, few paediatricians had received such training, even fewer used the learned skills, and very few felt competent in managing important comorbidities or making a difference to obesity. Nonetheless, interest was high in participating in obesity-related research.

Strengths and limitations: This study is, to our knowledge, unique in combining patient-level data from a national prospective audit of outpatient practice with national paediatrician-reported data on obesity-related competence and training. With regard to generalisability, less than half of Australian paediatricians are in the APRN, and less than half of APRN paediatricians responded to *both* the CAPS audit and the Multi-Topic Survey. However, responders and non-responders were broadly similar, and it seems unlikely that non-responders would be selectively more likely to diagnose and treat childhood obesity. Lack of national paediatrician demographic data precludes an assessment of how representative our sample is of the general paediatric workforce. Nor can we be sure that CAPS included all patients seen over the 2-week recording period, and there may be some selection bias if they did not. Finally, the study did not include any objective measure of competence or skills.

Interpretation in light of other studies: Our data are consistent with qualitative primary care studies showing that clinicians view childhood obesity as an important health issue, yet often feel frustrated and ineffectual.[19, 26, 27] Contributing factors include patient and family variables, e.g. lack of perception of weight as a problem, lack of motivation and difficulty in compliance;[26, 28] a lack of support services and options for referral; the sense

that clinicians need to be part of a broader systemic effort to tackle obesity;[28-29] and the rather low efficacy of clinical intervention in randomised trials.[18]

Health-care practitioners commonly express a desire for more training in childhood obesity,[30] but in Australia (and most likely elsewhere) there is no systematised approach to achieve this.[3] Childhood obesity could be addressed during paediatric training and in subsequent continuing medical education, particularly with respect to comorbidities. However, our data suggest that training alone may not greatly influence obesity management, and practitioners also experience substantial challenges in operationalising detailed expert guidelines.[3]

One option would be to implement short training modules that link to algorithms and toolkits in on-line repositories such as those already widely used by Australian paediatricians in real-time consultations.[31] For example, a simple tool kit for lifestyle counselling increased American residents' application of skills which, in turn, were associated with changes in family lifestyle and perception of child weight.[32] Another option endorsed by many of our respondents would be to link secondary and tertiary practitioners via shared-care models to both support and educate. Because the effectiveness of such initiatives is unknown, all should be embedded in a culture of research and evaluation – again, endorsed by our respondents. A third (and not necessarily exclusive) option is to argue that public health measures, rather than physician-directed management, may be the best long-term investment to address the problem of paediatric obesity itself. Under this scenario, paediatrician training and research would focus on comorbidities that could benefit from skilled medical management (e.g. insulin resistance, obesity-related hypertension), rather than concerted efforts to boost paediatricians' role in weight management and lifestyle guidance.

Conclusion: The role of paediatricians in improving health care and outcomes for obese children remains uncertain. Whatever this role, there is a clear need to systematically improve

research into high-priority treatment strategies. Beyond this, benefit will only flow for obese children if effective management models can then be operationalised systematically within health care systems.

Table 1: Australian paediatricians' self-reported competencies in managing obesity and its comorbidities.

Perceived competency	Mean (SD)	% reporting (n=166)			
		Very (3)	Quite (2)	A little (1)	Not at all (0)
Obesity management					
Discussing child’s weight when a parent broaches it	2.6 (0.6)	67	31	1	1
Broaching issue of an obese child’s weight yourself	2.4 (0.7)	47	45	7	1
Assessing an obese child	2.2 (0.7)	34	55	10	1
Managing a child with obesity	1.7 (0.7)	13	53	30	4
Making a difference to an obese child’s weight	1.1 (0.6)	2	18	69	10
Comorbidity management					
Obstructive sleep apnoea	1.7 (0.9)	15	48	27	10
Depression	1.6 (0.8)	13	44	34	10
Bullying and social difficulties	1.6 (0.8)	13	42	38	7
Insulin resistance and/or pre-diabetes	1.1 (0.9)	7	25	40	28
Hypertension	1.3 (0.8)	4	41	36	19
Fatty liver disease	0.9 (0.8)	3	19	41	37
Dyslipidaemia	0.9 (0.7)	1	19	51	29

Table 2: Self-reported training in and use of skills and techniques that may assist obesity management

Skill/technique	Percent (95% CI)		
	Trained in the skill (n=166) (a)	Trained in <u>and</u> use the skill (n=166)	Use skill regularly, if trained (denominator = column a)
Assessment of obesity-related comorbidities	53 (45 to 61)	14 (9 to 21)	26
Management of obesity-related comorbidities	37 (30 to 45)	10 (6 to 16)	27
Behavioral techniques to modify food & physical activity	19 (13 to 25)	4 (2 to 8)	23
Formal problem-solving techniques	19 (13 to 25)	2 (0.7 to 6)	13
Measuring and interpreting waist girth	14 (9 to 21)	4 (1 to 8)	22
Motivational interviewing	12 (8 to 18)	2 (0.7 to 6)	20

Table 3: Self-reported management skills as predictors of perceived competence in managing and making a difference to obesity^a (n=152).

Total number of....	Odds of reported competence ^b in..			
	Managing obesity		Making a difference to an obese child's weight	
	OR (95% CI)	p	OR (95% CI)	P
Skills/techniques...				
...trained in (mean 1.5 (SD 1.5); range 0-6)	1.4 (1.1 to 1.9)	0.005	1.5 (1.2 to 2.0)	0.001
...trained in <u>and</u> uses (mean 0.4 (SD 0.9); range 0-4)	1.3 (0.8 to 1.9)	0.3	0.9 (0.6 to 1.5)	0.8
Comorbidities...				
.... very/quite confident in managing ^c (mean 2.9 (SD 2.2); range 0-7)	1.6 (1.3 to 1.9)	<0.001	1.3 (1.1 to 1.5)	0.01
....very confident in managing ^d (mean 0.5 (SD 1.3); range 0-6)	2.2 (1.2 to 3.8)	0.01	1.1 (0.8 to 1.6)	0.4

OR = Odds Ratio, CI = Confidence Interval; all adjusted for paediatrician age, sex, SEIFA Disadvantage Index tertile of practice postcode

^a Table of associations between individual obesity and comorbidity management skills/techniques available from authors on request

^b Reported competence was taken from a questions asking how competent do you feel managing managing a child with obesity and how competent do you feel making a difference to an obese child's weight? The possible responses were "Very, Quite, A little or Not at all";competence was defined as "very" or "quite".

^{c,d} Summed items from Table 1 (Comorbidity management)

Table 4: Self-reported (a) competence and (b) training in obesity management as predictor of CAPS practice audit findings

Variable	Adjusted odds of child having complete measurements		Adjusted odds of obese child having obesity diagnosis	
	OR (95% CI) ^a	P	OR (95% CI) ^b	P
Perceived competence^c in...				
...assessing an obese child	1.0 (0.7-1.4)	0.9	1.6 (1.0-2.7)	0.05
...managing childhood obesity	1.2(0.8-1.7)	0.4	1.9 (1.3-3.0)	0.003
...making a difference to a child's weight	1.1 (0.7-1.9)	0.7	1.3 (0.8-2.3)	0.3
Training in skill / technique^d				
Assessment of obesity-related comorbidities	0.7 (0.4 – 1.1)	0.1	1.4 (0.8 – 2.6)	0.3
Management of obesity-related comorbidities	0.7 (0.4 – 1.3)	0.3	1.4 (0.7 – 2.8)	0.3
Measuring and interpreting waist girth	1.1 (0.6 – 2.1)	0.8	1.1 (0.4 – 2.5)	0.9
Behavioural techniques to modify food & phys activity	1.0 (0.5 – 1.8)	0.9	1.9 (0.9 – 4.0)	0.1
Motivational interviewing	0.5 (0.2-1.2)	0.1	1.3 (0.4-4.7)	0.7
Formal problem-solving techniques	0.4 (0.2-0.9)	0.02	1.8 (0.5 – 5.9)	0.4
Total number of^e...				
... skills/techniques trained in	0.9 (0.7-1.0)	0.04	1.2 (1.0-1.4)	0.2
... skills/techniques trained in <u>and</u> used	1.0 (0.7-1.4)	1.0	1.2 (0.8-1.7)	0.5
... comorbidities very/quite confident in managing	0.9 (0.8-1.1)	0.3	1.1 (1.0-1.3)	0.05

OR = Odds Ratio, CI = Confidence Interval

^a Allows for clustering by paediatrician, adjusted for type of practice and child age group. n(paed)=116, n(child)=3037

^b Allows for clustering by paediatrician, adjusted for child sex and child age group. n (paed)=89, n(child)=294

^cPerceived competence is scored 0-3, analysed as a linear variable

^dTraining in individual skills / techniques – yes/ no variable

^eTotals –analysed as ordinal variables

Table 5: Australian paediatricians' interest in participating in different types of childhood obesity research.

Variable	%
Interested in research (n=166)	71
Area of research (n=117, i.e. 71% of 166)	
Obesity itself	88
Co-morbidities of obesity	65
Other	7 ^a
Type of research project (n=117)	
Recruiting children to a longitudinal study	83
Shared care trial – you deliver systematic joint care with specialist obesity team	64
Management trial – delivered outside your practice (eg community setting, tertiary care)	58
Recruiting children to a data repository and/or biobank	51
Shared care trial – you deliver systematic joint care with GP	44
Management trial in your practice - you deliver intervention	40
Management trial in your practice – allied health or nurse delivers intervention	33
Age group of child (n=117)	
Any	73
Toddler (any + toddler only)	87
Primary school (any + primary school only)	95
Secondary school (any + secondary school only)	81

^a Other suggested topics: obesity in special needs children; hyperinsulinism; mood, family functioning; emotional/psycho/social; useful techniques in general paed practice and for GPs; effective sustainable management strategies; and obesity as part of genetic syndrome

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DATA SHARING: data are available – please contact the corresponding author.

WHAT IS ALREADY KNOWN ON THIS TOPIC:

- Inadequate treatment access and health workforce training are significant barriers to providing optimal care for obese children and adolescents.
- Primary care obesity interventions are rarely efficacious and tertiary services are limited, so secondary care may be the optimal pathway for managing child/adolescent obesity.
- How paediatricians approach obesity, their skills in managing obesity, and how training affects their skills and self-reported competencies, are unknown.

WHAT THIS STUDY ADDS:

- Training in specific skills improved self-reported competence and, in turn, slightly higher rates of diagnosis.
- Few paediatricians received training, even fewer used the learned skills, and very few felt competent in managing comorbidities or making a difference to obesity.
- Despite feelings of inefficacy around managing child/adolescent obesity, paediatricians are interested in participating in obesity-related research.

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The 2010 APRN Multitopic Survey

Introduction

The APRN is delighted to bring you the 2010 Multi Topic Survey, with 5 topics led by paediatricians around Australia. We hope that it will provide important new information that leads on to larger APRN studies. There are also some questions about how you use computers, to plan how best to conduct studies with you.

Your information is strictly confidential.
We will never report individual responses.
Your name may be used to contact you regarding specific projects.

If you have any questions please contact us on:
Phone: (03) 9345 6168
Email: aprn.paeds@rch.org.au

Section 1: About You

First could we update your information:

Name:

(Your name helps us coordinate the survey and contact you about specific projects. It will not be linked to your data when we analyse the survey results)

First Name

Surname

What year were you born?

Gender:

☐ Male

☐ Female

Which of the following best describes your main practice?

☐ Metropolitan

☐ Regional

☐ Rural

What is the postcode of your main practice?

Which of the following best describes your secondary practice?

☐ Metropolitan

☐ Regional

☐ Rural

☐ N/A

What is the postcode of your secondary practice?

Do you consider your working hours to be:

☐ Full time

☐ Part time

The 2010 APRN Multitopic Survey

Are you currently involved in research?

☐ Yes

☐ No

Which of the following best describe your current practice? (mark all that apply)

☐ Academic post

☐ Private practice

☐ Community health centre

☐ Public hospital post

☐ Other

If Other, please specify:

Section 2: About your computer use

Do you have a PDA or smartphone (iPhone or Blackberry for example) that you use for work purposes?

☐ Yes

☐ No

Do you have access to a computer at work?

☐ Yes

☐ No

Section 2: About your computer use

Now thinking about the main rooms where you see patients:

	Yes	No
Do you have a computer in each room you see patients?	☐	☐
Can you access the internet at acceptable speeds in each room you see patients?	☐	☐
Does this practice use a computerised patient booking and billing system?	☐	☐

Do you use computerised medical records in these rooms?

☐ Yes

☐ No

Section 2: About your computer use

The 2010 APRN Multitopic Survey

Which computerised medical system do you use?

☐ Genie

☐ Medical Director

☐ Other

If Other, please specify:

What do you use your computerised medical records for? (mark all that apply)

☐ Write new and follow-up notes

☐ Receive results

☐ Write scripts

☐ Write patient letters

☐ Write referrals

☐ Record height and weight electronically

☐ Order tests

☐ Calculate and record BMI electronically

☐ All of the above

☐ Other

If Other, please specify:

Section 3: About ADHD

Do you see children with ADHD?

☐ Yes

☐ No

Section 3: About ADHD

In an average month, how many children would you see for an initial assessment for ADHD?

How many consultations do you usually take to assess a child for ADHD?

☐ 1

☐ 2

☐ 3

☐ Other

The 2010 APRN Multitopic Survey

How often do any of the following form part of your ADHD assessment?

	Always/almost always	Often	Sometimes	Rarely	Never
Height	☐	☐	☐	☐	☐
Weight	☐	☐	☐	☐	☐
Blood pressure	☐	☐	☐	☐	☐
Parent questionnaires	☐	☐	☐	☐	☐
Teacher questionnaires	☐	☐	☐	☐	☐
Self-report questionnaires	☐	☐	☐	☐	☐
Conversation with teacher	☐	☐	☐	☐	☐
School visit	☐	☐	☐	☐	☐
Medical investigations	☐	☐	☐	☐	☐
Direct assessment tools	☐	☐	☐	☐	☐

Please list any parent, teacher or self report questionnaires that you use:

Please describe any medical investigations or direct assessment tools that you use:

How often do you refer children for the following as part of your assessment (+/- comorbidities)?

	Always/almost always	Often	Sometimes	Rarely	Never
Psychology (cognitive, academic, or neuropsychology assessment)	☐	☐	☐	☐	☐
Occupational therapy	☐	☐	☐	☐	☐
Speech pathology	☐	☐	☐	☐	☐
Audiology	☐	☐	☐	☐	☐
Special education	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐

If Other, please specify:

We are planning an APRN longitudinal study about ADHD. We will ask interested paediatricians to:

- Identify newly diagnosed children with ADHD
- Collect brief (half page) de-identified information for a three month period
- Seek permission from parents for the study team to contact them directly about taking part; and for those parents who do take part:
- Provide annual information on height, weight, blood pressure and medication use.

The 2010 APRN Multitopic Survey

Would you be willing to refer children with ADHD into a longitudinal study?

☐ Yes

☐ No

☐ Not sure

If you selected No/Not sure, please indicate the reason:

What is the easiest way for you to send this information to the study team?

☐ Fax

☐ Telephone

☐ Post

☐ Email

For families in the longitudinal study, we will call them three months before their twelve month follow-up date to ensure that they have an appointment with you.

Do you have any comments or concerns about this process?

☐ Yes

☐ No

If yes, please describe

What is the best way for us to remind you about referring children?

☐ Email

☐ A4 laminated poster

☐ Letter

☐ SMS

☐ Phone call

☐ Other

If Other, please specify:

Section 4: About child and adolescent obesity

How competent do you feel about...

	Very	Quite	A little	Not at all
broaching the issue of an obese child's weight yourself?	☐	☐	☐	☐
discussing the child's weight when a parent broaches it?	☐	☐	☐	☐
assessing an obese child?	☐	☐	☐	☐
managing a child with obesity?	☐	☐	☐	☐
making a difference to an obese child's weight?	☐	☐	☐	☐

The 2010 APRN Multitopic Survey

Have you had any specific training in:

	No	Yes	Mark if you use this regularly
☐ motivational interviewing?	☐	☐	☐
☐ formal problem solving techniques?	☐	☐	☐
☐ behavioural techniques to modify food and physical activity?	☐	☐	☐
☐ measuring and interpreting waist girth?	☐	☐	☐
☐ assessment of obesity-related comorbidities?	☐	☐	☐
☐ management of obesity-related comorbidities?	☐	☐	☐

How competent do you feel now about managing obesity-related comorbidities?

	Very	Quite	A little	Not at all
☐ Insulin resistance and/or pre-diabetes	☐	☐	☐	☐
☐ Fatty liver disease	☐	☐	☐	☐
☐ Obstructive sleep apnoea	☐	☐	☐	☐
☐ Hypertension	☐	☐	☐	☐
☐ Dyslipidaemia	☐	☐	☐	☐
☐ Depression	☐	☐	☐	☐
☐ Bullying and social difficulties	☐	☐	☐	☐

Are you potentially interested in taking part in an obesity-related research project through the APRN? (Note: this doesn't mean that you've agreed to!)

☐ Yes

☐ No

Section 4: About child and adolescent obesity

Is there any age group you would like to include in such a project? (mark all that apply)

☐ Any

☐ Toddler/Preschool

☐ Primary School

☐ Secondary School

Are you interested in research that mainly deals with: (mark all that apply)

☐ Obesity itself

☐ Its comorbidities

☐ Other

If Other, please specify:

The 2010 APRN Multitopic Survey

What types of obesity research projects might you consider taking part in? (please mark all that apply – none are mutually exclusive!)

- ☐ Recruiting children to a longitudinal study
- ☐ Recruiting children to a data repository and/or biobank
- ☐ Management trial – delivered outside your practice (eg community setting, tertiary care)
- ☐ Management trial in your practice – you deliver intervention
- ☐ Management trial in your practice – allied health or nurse delivers intervention
- ☐ Shared-care trial – you deliver systematic joint care with specialist obesity team
- ☐ Shared-care trial – you deliver systematic joint care with the child's GP
- ☐ None of the above
- ☐ Other

If Other, please specify:

Section 5: About Learning Problems

Do you see children with learning problems?

☐ Yes

☐ No

Section 5: About Learning Problems

For this survey, we define learning problems as unexpected academic underachievement in a child who does not have an intellectual disability, or an obvious underlying medical or environmental cause.

How many consultations do you usually allocate to assess a child who presents with learning problems?

☐ 1

☐ 2

☐ 3

☐ Other

The 2010 APRN Multitopic Survey

Apart from a history and examination, what other assessment modalities do you routinely use?

	Always/almost always	Often	Sometimes	Rarely	Never
Parent questionnaires	☐	☐	☐	☐	☐
Teacher questionnaires	☐	☐	☐	☐	☐
Medical investigations	☐	☐	☐	☐	☐
Direct assessment tools	☐	☐	☐	☐	☐
Audiology	☐	☐	☐	☐	☐
School visit/observation	☐	☐	☐	☐	☐
Teacher telephone/email contact	☐	☐	☐	☐	☐

Please list any parent or teacher questionnaires that you use:

Please describe any medical investigations or direct assessment tools that you use:

What types of learning problems do you diagnose?

- ☐ Literacy difficulty (reading, writing and/or spelling)
- ☐ Numeracy difficulty
- ☐ Mixed disorders
- ☐ Other

If Other, please specify:

How often do you involve the following health professionals for a child with learning problems?

	Always/almost always	Often	Sometimes	Rarely	Never
Educational psychology	☐	☐	☐	☐	☐
Special education	☐	☐	☐	☐	☐
Speech therapy	☐	☐	☐	☐	☐
Occupational therapy	☐	☐	☐	☐	☐
Mental health	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐

If Other, please specify:

The 2010 APRN Multitopic Survey

What management strategies do you use and recommend? (mark all that apply)

☐ Written report to school	☐ Omega-3 fatty acids	☐ Sleep hygiene
☐ Written report to parents	☐ Diet changes	☐ None of the above
☐ Handouts for home and school	☐ Tutoring	☐ Other

If Other, please specify:

Section 6: About congenital hearing loss

Have you had any children with permanent hearing loss in your practice during the past 3 years?

(Don't include otitis media with effusion (glue ear). Do include all severities - mild, moderate, severe, profound - and unilateral as well as bilateral)

☐ No

☐ Yes

Section 6: About congenital hearing loss

About how many children with permanent hearing loss have you had in your practice during the past 3 years?

What ages were these children? (mark all that apply)

☐ <12 months	☐ 10 years to <15 years
☐ 12 months to <5 years	☐ ≥15 years
☐ 5 years to <10 years	☐ Don't know

What is/are your main roles in their management? (mark all that apply)

☐ Aetiological investigation	☐ Referring to other specialists
☐ Developmental surveillance/FU	☐ Supporting parents
☐ Managing comorbidities	☐ Other

Section 6: About congenital hearing loss

The 2010 APRN Multitopic Survey

What newborn hearing screening service does your state/territory currently offer?

- ☐ All hospitals, to all their newborns
 ☐ Some hospitals, high risk newborns only
 ☐ Some hospitals, to all their newborns
 ☐ Not offered
 ☐ All hospitals, high risk newborns only
 ☐ Don't know

Who should routinely be involved in the care of a child with hearing impairment? (mark all that apply)

- ☐ Audiologist
 ☐ Paediatrician
 ☐ Ophthalmologist
 ☐ ENT surgeon
 ☐ Geneticist
 ☐ Other

Who should coordinate the care of a child with hearing impairment?

- ☐ Audiologist
 ☐ Paediatrician (general/developmental)
 ☐ ENT surgeon
 ☐ Early interventionist/Teacher of the deaf
 ☐ Paediatrician (special deafness interest)
 ☐ Other

Write in your best estimate of the earliest age at which a baby or child (Years, Months):

not passing a hearing screen should receive additional testing

can be definitively diagnosed as having a permanent hearing loss

can begin wearing hearing aids

with permanent hearing loss should be referred for early intervention

Which children with a hearing loss may be a candidate for cochlear implants? (tick all that apply)

	Mild	Moderate	Severe	Profound
Unilateral	☐	☐	☐	☐
Bilateral	☐	☐	☐	☐

Which of the following put a child at risk for permanent later onset (eg non-congenital) hearing loss? (mark all that apply)

- ☐ Meningitis
 ☐ Mother over age 40
 ☐ Frequent colds
 ☐ Congenital heart disease
 ☐ Hypotonia
 ☐ History of cytomegalovirus (CMV)
 ☐ >48 hours in NICU
 ☐ Congenital syphilis
 ☐ Cleft palate
 ☐ Family history of childhood hearing loss
 ☐ None of the above

The 2010 APRN Multitopic Survey

How well informed do you feel about the following issues?

	Very well	Fairly	A little	Not at all
Causes of hearing loss	☐	☐	☐	☐
Consequences of unilateral or mild hearing loss	☐	☐	☐	☐
Consequences of bilateral moderate-profound hearing loss	☐	☐	☐	☐
Medical interventions (eg cochlear implants)	☐	☐	☐	☐
Audiological interventions (eg hearing aids)	☐	☐	☐	☐
Communication options (eg auditory-oral, signing)	☐	☐	☐	☐
Early intervention options	☐	☐	☐	☐
Education options	☐	☐	☐	☐
Genetics of hearing loss	☐	☐	☐	☐
Family support services	☐	☐	☐	☐

Section 7: About melatonin use

Do you prescribe melatonin for children?

☐ Yes

☐ No

If no, why not?

Section 7: About melatonin use

What is the youngest age you have prescribed it?

Years

Months

What is the oldest age you have prescribed it?

Years

Months

What conditions/problems do you prescribe it for? (mark all that apply)

- ☐ Difficulty falling asleep
- ☐ Night time waking
- ☐ Delayed sleep phase (ie going to bed late and waking late)
- ☐ Obstructive sleep apnoea
- ☐ Other

If Other, please specify:

The 2010 APRN Multitopic Survey

In what populations do you prescribe melatonin? (mark all that apply)

- ☐ Normally developing children with conditions/problems listed above
- ☐ Developmental delay
- ☐ Autism
- ☐ ADHD
- ☐ Behavioural disorders
- ☐ Anxiety disorders
- ☐ Visually impaired children
- ☐ Other

If Other, please specify:

What melatonin dosage (in mg) do you use for:
(enter 0 if you do not use it for that age group)

Infants?

Children?

Adolescents?

On average, how many weeks do you prescribe melatonin for?

On average, how many weeks after prescribing melatonin do you review your patient?

Are you aware of any side effects?

☐ Yes

☐ No

If yes, can you say what they are?

Before prescribing melatonin, do you try any other medication/strategies?

☐ Yes

☐ No

Section 7: About melatonin use

The 2010 APRN Multitopic Survey

Which strategies do you use for each of the conditions below? (mark NA if you do not see that condition)

	Anxiety relaxation techniques	Controlled crying	Limit setting	Camping out	Changing bed time/wake time	Other (eg transition toys, sensory strategies)	NA
Sleep initiation	€	€	€	€	€	€	€
Disrupted over night sleep	€	€	€	€	€	€	€
Delayed sleep phase	€	€	€	€	€	€	€
Obstructive sleep apnoea	€	€	€	€	€	€	€

Which medications do you use for each of the conditions/problems below? (Do not complete this question if you do not see that condition)

	SSRIs/SNRIs	Vallergan/phenergan	Clonidine	Benzodiazapines	Antiepileptics/neuroleptics	No medication	Other
Sleep initiation	€	€	€	€	€	€	€
Disrupted over night sleep	€	€	€	€	€	€	€
Delayed sleep phase	€	€	€	€	€	€	€
Obstructive sleep apnoea	€	€	€	€	€	€	€

If Other, please specify:

Thankyou

Thankyou for taking the time to complete this survey.

If you have any questions please contact us at:
aprn.paeds@rch.org.au

Or visit the website:
www.aprn.org.au

Example of completed CAPS data collection form

8277152967		1. PATIENT INFORMATION - PLEASE PRINT IN CAPITAL LETTERS																																				
a. Date of visit 20 / 11 / 2008		b. Gender ☒ M ☐ F																																				
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2. PROVIDER'S DIAGNOSIS FOR THIS VISIT Current diagnoses/problem list at this visit - please refer to code list on opposite page and mark whether new or continuing. If no code, please specify the diagnosis.		3. MEDICATIONS & IMMUNIZATIONS ☐ NONE Include Rx & OTC drugs, immunizations, allergy shots, anaesthetics, chemotherapy & dietary supplements that were ordered, supplied, administered or continued during visit.																																				
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a. Date of visit 20 / 11 / 2008		b. Gender ☒ M ☐ F																																				
c. Start Time (pls circle) 09:10 AM / PM		g. Is English main language spoken at home? ☒ Y ☐ N → which language? ↓ Need interpreter? ☐ Y ☐ N																																				
d. FAMILY Postcode: 2145		h. Mark those that apply ☐ HCC / Carer's Allowance ☐ ATSI																																				
e. PAED postcode THIS session: 2132		i. Child's Date of Birth 13 / 03 / 1998																																				
f. Where seen? ☐ Public Outpatients ☒ Private Room ☐ Community Health Centre		Paediatrician ID: 1228																																				
2. PROVIDER'S DIAGNOSIS FOR THIS VISIT Current diagnoses/problem list at this visit - please refer to code list on opposite page and mark whether new or continuing. If no code, please specify the diagnosis.		3. MEDICATIONS & IMMUNIZATIONS ☐ NONE Include Rx & OTC drugs, immunizations, allergy shots, anaesthetics, chemotherapy & dietary supplements that were ordered, supplied, administered or continued during visit.																																				
<table border="1"> <thead> <tr> <th>CODE</th> <th>OR PLEASE PRINT Dx</th> <th>New</th> <th>Cont</th> </tr> </thead> <tbody> <tr> <td>(1) 05</td> <td></td> <td>☐</td> <td>☒</td> </tr> <tr> <td>(2) 56</td> <td></td> <td>☒</td> <td>☐</td> </tr> <tr> <td>(3) 41</td> <td>(2)</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>(4) 44</td> <td></td> <td>☒</td> <td>☐</td> </tr> </tbody> </table>		CODE	OR PLEASE PRINT Dx	New	Cont	(1) 05		☐	☒	(2) 56		☒	☐	(3) 41	(2)	☒	☐	(4) 44		☒	☐	<table border="1"> <thead> <tr> <th></th> <th>New</th> <th>Cont</th> </tr> </thead> <tbody> <tr> <td>(1) Serenent 8mg Tbb</td> <td>☐</td> <td>☒</td> </tr> <tr> <td>(2)</td> <td>☐</td> <td>☐</td> </tr> <tr> <td>(3)</td> <td>☐</td> <td>☐</td> </tr> <tr> <td>(4)</td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>			New	Cont	(1) Serenent 8mg Tbb	☐	☒	(2)	☐	☐	(3)	☐	☐	(4)	☐	☐
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4. MEDICARE ITEMS Medicare Item Nos: (Pls mark if applicable)		5. INVESTIGATIONS Mark all tests ordered or provided at this visit:																																				
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Table S4 (supplementary material available online only): Associations between self-reported training in/use of individual obesity management skills and competence

Skill / technique	Odds of reporting competence, by training vs. no training			
	In managing obesity		In making a difference	
	OR (95% CI)	p	OR (95% CI)	P
Trained in the skill				
Assessment of obesity-related comorbidities	1.8 (0.9 to 3.7)	0.08	2.0 (0.8 to 4.6)	0.1
Management of obesity-related comorbidities	3.3 (1.6 to 7.3)	0.002	2.0 (0.9 to 4.2)	0.1
Behavioral techniques to modify food & physical activity	3.3 (1.1 to 9.3)	0.03	4.5 (1.8 to 11.2)	0.001
Formal problem-solving techniques	1.3 (0.5 to 3.5)	0.6	2.3 (0.9 to 6.2)	0.08
Measuring and interpreting waist girth	1.5 (0.6 to 4.3)	0.4	2.9 (1.1 to 7.9)	0.04
Motivational interviewing	3.2 (0.9 to 11.9)	0.08	3.5 (1.2 to 10.2)	0.02
Trained in <u>and</u> use the skill				
Assessment of obesity-related comorbidities	1.5 (0.6 to 4.2)	0.4	1.0 (0.4 to 3.1)	0.9
Management of obesity-related comorbidities	1.5 (0.4 to 5.1)	0.5	1.5 (0.4 to 5.1)	0.5
Behavioral techniques to modify food & physical activity	0.8 (0.2 to 3.7)	0.7	a	a
Formal problem-solving techniques	a	a	a	a
Measuring and interpreting waist girth	1.2 (0.2 to 7.0)	0.8	0.8 (0.1 to 7.0)	0.8
Motivational interviewing	a	a	1.2 (0.1 to 12.4)	0.9

*OR = Odds Ratio, CI = Confidence Interval; all adjusted for paediatrician age, sex, SEIFA Disadvantage Index of practice postcode

^aThese odds ratios and p values could not be calculated since none of those who were not trained in the skill felt competent in management/making a difference