Journal of
Dentistry and Oral Health

JScholar
Fostering Scholarly Communication

Research Open Access

Factors Influencing Provision of Preventive Oral Health Care to Adolescents Attending Public Oral Health Services in New South Wales, Australia

Angela V Masoe[1,*], Anthony S Blinkhorn[2], Jane Taylor[1] , Fiona A Blinkhorn[1]

[1]Faculty of Health, Oral Health, School of Health Sciences, Ourimbah Campus, University of Newcastle, NSW, Australia
[2]Faculty of Dentistry, University of Sydney, NSW, Australia

***Corresponding author:** Angela V Masoe, Faculty of Health, Oral Health, School of Health Sciences, Ourimbah Campus, University of Newcastle, NSW, Australia. E-mail: Angela.Masoe@gsahs.health.nsw.gov.au

Received Date: August 25, 2014; **Accepted Date:** September 27, 2014; **Published Date:** September 29, 2014

Citation: Angela V. Masoe, *et al.* (2014) Factors Influencing Provision of Preventive Oral Health Care to Adolescents Attending Public Oral Health Services in New South Wales, Australia. J Dent Oral Health 1: 1-9

Abstract

Background: Many adolescents are at risk of dental caries and periodontal disease due to poor tooth brushing and dietary behavior. However, these oral health problems can be moderated by providing individuals with preventive care and advice. In New South Wales (NSW) Dental Therapists and Oral Health Therapists (Therapists) working in the public health system can help this vulnerable group by providing free dental care including advice on preventing dental caries and periodontal disease. The aim of this study was to identify factors that influence Therapists in the provision of preventive care to adolescents.

Method: Sixteen Therapists working in four NSW Local Health Districts (LHDs) participated in three structured two hour focus group sessions to: identify motivators/enablers to providing oral health care for adolescents in a clinic-based setting; and to record their solutions and strategies to enhance preventive practice. These discussions were interactively mapped, audio-recorded for recall and coded for thematic analysis.

Results: The participants identified personal self-health values, altruism, professional career satisfaction, professional clinical ethics, and their ability to relate and engage with adolescents as motivators to provide preventive care. They acknowledged that psychosocial determinants of health factors such as mental health, transient home concerns, knowledge of how to access timely oral health care, relying on others for transport, oral health literacy and dental phobias all impacted on their ability to provide effective preventive care to adolescents. These factors were the main reasons why they needed to reach out, advocate and invest time on preventive care for adolescents.

Conclusion: The Therapists believed in the value of preventive oral health care but reported that there were some overwhelming challenges that impacted on their ability to offer this service.

Keywords: Adolescents; Public oral health preventive care; Constraints; Facilitators; Therapists

Background

Oral health is integral to general health, and is essential for individuals to enable them to communicate effectively, have a positive quality of life, and maintain self-esteem and social self-confidence [1]. The oral health of the Australian population has improved over the last 30 years, largely due to increased access to water fluoridation and the widespread use of fluoride toothpaste [2-5]. Despite these positive changes dental caries in particular remains one of the most common chronic diseases affecting both children and adolescents.

Armfield, et al. [6] reported that over 50% of 12 to 15 year olds suffered from dental caries in the 2003-2004 National Australian Child Dental Survey. Skinner, et al. [7] in a New South Wales (NSW) study found that over 45 per cent of 12 to15 year olds had dental caries. The latter study showed poorer levels of dental health among those: (i) from rural and remote regions (DMFT 2.4 versus State mean of 1.2); (ii) with parents on low income (DMFT 1.8 versus 0.7); and (iii) with limited access to fluoride water supplies (DMFT 1.7 versus 1.1 for those in fluoridated areas).

Adolescent patients are recognized as having distinct needs because of their tendency to have a higher sugar diet, poor oral

hygiene, use tobacco, alcohol and other drugs, and unique social and psychological needs [8-11]. These problems highlight the importance of offering preventive oral health advice and care [8, 12-15].

Dental caries and periodontal diseases are largely preventable and reversible if identified and managed early [16]. Changes in health behaviour can help prevent oral diseases such as: reducing the frequency of sugary food and drink intake; brushing teeth and gums twice a day with fluoride toothpaste; drinking fluoridated tap water; modifying alcohol consumption; ceasing tobacco use; and attending for regular professional oral health check-ups [8].

A range of oral health services are provided through the NSW public health system. These include dental services to children, adolescents and eligible adults according to criteria that prioritise emergency situations, those in most need and at highest risk of disease, dental education and oral health promotion services [17]. The NSW Ministry of Health is the purchaser and system administrator. Local Health Districts (LHDs) are responsible for providing the funds required to deliver services to address local needs [17]. The Oral Health Service is an integral part of the NSW public health system and offers free oral health care to all individuals under 18 years of age [17]. These services are mainly provided by Dental Therapists and Oral Health Therapists (Therapists). They have a pivotal role in the prevention of dental caries and periodontal disease [18-21] because of their academic training in oral health promotion and their expertise in providing oral health care to children and adolescents. They are well placed in public oral health settings to engage and support adolescent's self- efficacy towards good oral health. Oral Health 2020: A strategic framework for dental health in NSW [17] encourages the development of targeted models of care for identified groups that promote client-centric service provision and prevention, and integration with other health care and community groups.

Researchers [22-30] recommend the following preventive care strategies for patients at risk of developing dental disease:

(i) Dietary advice (including drinks)
(ii) Oral hygiene instruction
(iii) Fluoride varnish application
(iv) Fissure sealants to reduce occlusal caries in permanent teeth
(v) Managed care at appropriate intervals for high risk individuals
(vi) Follow-up radiographs to monitor the progress of early caries lesions
(vii)Smoking cessation brief intervention for appropriate patients
(viii) Utilisation of Motivational Interviewing (MI)

These recommendations have been integrated into the NSW Ministry of Health policy for providing preventive care to children under 18 years targeting those most at risk of dental disease [31-33]. The Information System for Oral Health (ISOH: Information System for Oral Health: a NSW State-wide Public Oral Health Service centralised repository for patient data information) is used to determine what activity is conducted across the state by clinician's to align with the policy as identified by dental treatment item numbers based on the Australian national dental schedule [34]. The suite of preventive care activities used for individual clinician performance appraisal and LHD service agreement performance are categorised in Table 1.

Personalised preventive care offered:
Radiographs (Bitewings and Periapical)
Dietary advice
Oral Hygiene Instruction
Remineralising agents (Professional fluoride applications, casein phosphopeptide with amorphous fluoride phosphates (CPP-ACFP)
Fissure sealants
Prophylaxis (scaling and cleaning)
Smoking cessation
Recommendation (issue) of appropriate oral health products for home care use: discosing tablets, tooth brush, fluroide tooth paste, CPP-ACFP paste, floss
Issue of age appropriate oral health education literature
Utilise Motivational Interviewing and coaching techniques

Table 1: Preventive care activities for adolescents attending NSW Public Oral Health Service

There appears to be variation of how this policy is implemented across the State. Therefore, this study was undertaken to identify: (i) influencing factors to providing clinic-based oral health care to adolescents and (ii) to record the strategies which therapists believed could enhance their preventive clinical practice.

Method

Qualitative methodology was used to investigate the two study aims. Focus groups were used as they can be both exploratory and descriptive. Participants were recruited by purposive sampling, selecting participants from rural and metropolitan locations to answer the research questions [35]. Three focus groups were arranged with staff from four NSW Local Health Districts (LHDs): Murrumbidgee and Southern NSW LHDs were combined to represent rural and remote, South Eastern Sydney LHD represented metropolitan and Hunter New England LHD was a rural area in close proximity to a large city population.

To ensure scientific rigor and reliability of research data collected for the group sessions, the principles of Community Participatory Action Research (PAR) [36] were adopted, namely, equitably involving all the participants in the research process and acknowledging the unique strengths that each one brings to the session.
The focus group discussion was on a topic central to the Therapists' daily lives [36], therefore pre-planning for structuring the focus group sessions was essential and included:
- A facilitation process: the participants were requested to write down their answers to what they perceived as motivators/enablers, constraints and proposed solutions for them to provide preventive care to adolescents on paper prior to sharing with the group,
- Capturing the data: A1 postie posters were used to capture discussion themes,

- All discussions were recorded to assist recall and help with the identification of topics
- The group discussion was summarized by a facilitator and participants were asked to confirm the points noted at the conclusion of the session.

The qualitative data analysis continued after the focus group sessions using the Thematic Analysis inductive approach [37]. Systematic steps pertaining to Thematic Analysis [37] were followed: (i) familiarisation with data by synthesising all data from focus groups onto a framework matrix using Microsoft Excel (ii) creating codes that identified unique features of the data relevant to answer the research questions (iii) review and further development of themes as dictated by the collected data (iv) comprehensive, inclusive and thorough examination of the codes to identify patterns of meaning (generating themes) (v) data analysed, interpreted and a narrative composed of key themes and (vi) verification of processes by academic principal investigators.

Ethics approval was obtained from lead Health and Research Ethics Committee Hunter New England LHD No. LNR/11HNE/495, Southern NSW LHD No. LNRSSA/12/GSAHS/30, Murrumbidgee LHD No. LNRSSA/12/GSAHS/31 and South Eastern Sydney LHD No. LNRSSA/12/STG/65

Results

Sixteen Therapists (thirteen females and three males) participated in the three two hour focus groups. The year of graduation ranged from 1972 to 2011, and they worked across ten dental clinics within the four LHDs in NSW. Participant's described their perceptions of being employed by the NSW Health public oral health system to providing preventive services to adolescents. The overall theme identified from this study was 'Facilitating Preventive Oral Health Care for Adolescents'. The key theme is supported by subthemes described in the following sections and illustrated in Figure 1.

Professional ethics and personal self-health preventive values

Personal and professional values motivated and enabled the participants to facilitate the provision of preventive care and ensure quality health care was provided for their patients. They made reference to the importance of maintaining registration and their professional commitment to ensure they keep abreast with current clinical oral health approaches for the provision of patient quality care.

"Preventive care compliments the restorative treatment or after relief of pain emergency appointments. It is our duty to encourage them to return for preventive care" (FG2).

The majority of participants referred frequently to the importance of self-health and professional values. They wanted to contribute and participate in maintaining a healthy community and this motivated them to provide preventive care for patients. To work with challenging cases, recognising the importance of supporting vulnerable adolescents specifically those with psychosocial issues, was also a main motivator.

"We are getting quite a few 16 and 17 year olds coming in. They are wondering why they've got sensitive teeth, why the illicit drugs actually cause them to grind, clench [their teeth]. We can at least try to get them to start thinking about this, what they are doing now, [how it is]having an impact long term" (FG1).

Most participants reported providing preventive care to patients was an essential component of their clinical professional ethical duty.

"Preventive care, it's doing the right thing; it's our duty of care, that's what we are here for, isn't it?" (FG2).

Adolescents' who valued oral health, and achieved good oral health outcomes was professionally rewarding and satisfying for all the participants. Those working in rural settings reported adolescents re-presenting until they exited the programs upon turning 18 years of age.

"We have lovely patients; I am motivated by their smiles after I have completed all their work, and their mouths are free of pain. They have managed to maintain good tooth brushing habits, which really motivate me" (FG1).

Where adolescent's displayed lack of concern for their oral health, participants stated at times affected their motivation levels.

"You treat everyone the same, get job satisfaction. Sometimes it is very challenging, I have a patient that gets all the support but keeps presenting with yet another cavity, that can demotivate me" (FG2).

Academic training

The public oral health setting provided opportunities to apply knowledge and skills from academic education was a major motivator/enabler for most participants.

"My University training and education: a lot of depth or focus on prevention, which helps my current practice in public health" (FG3)

These participants reported that the ability to practice evidence based principles of Minimal Intervention Dentistry (MID) to treat caries and concentrate on addressing lifestyle determinants of oral health was a 'big enabler' for them. However, some participants reported variations in clinician preventive care approaches.

"What separates the way we practice, there is a difference in philosophy, [...] tends to be treating the lesions, rather than treating the lifestyle disease, that's a big difference" (FG3).

Historically, some participants stated their training on children under 12 years of age, then the client groups expanded to 14 year olds, and finally all children under the age of 18 years. A number of participants commented that they lacked confidence to work with adolescents, and preferred to work with younger patients.

"Much prefer working with younger ones, I have more confidence addressing their needs more than teenage dental problems" (FG1).

Professional development strategies including the enhancement of clinical learning environments to foster professional team mentorship and support were suggested by participants.

"Creating clinical learning environments where we are encouraged to share clinical case studies" (FG2).

Professional development

The majority of participants reported valuing continuing professional development and stated it was a key enabler for pro-

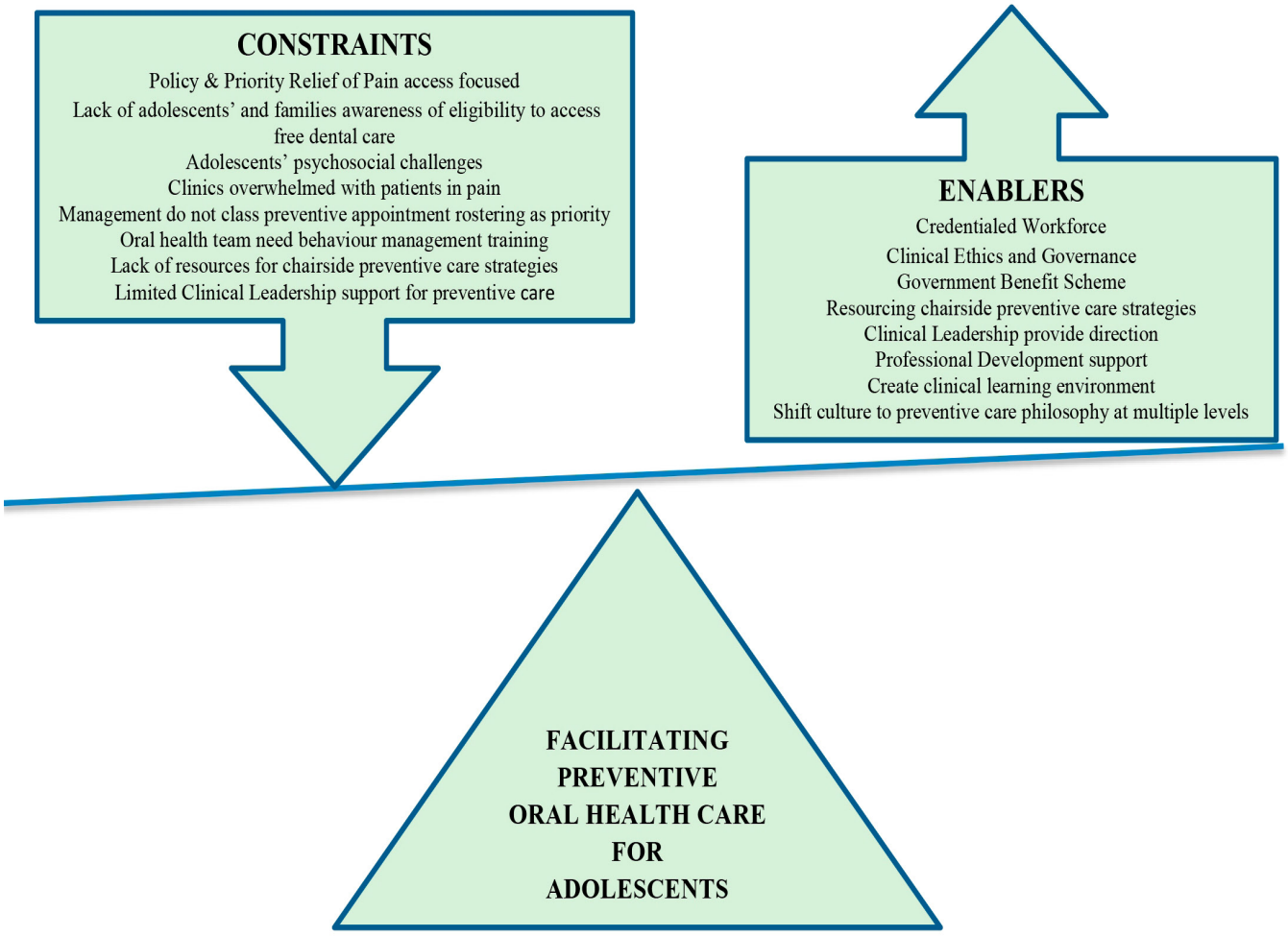

Figure 1: Factors influencing the provision of preventive care by Therapists to adolescents accessing NSW Public Oral Health Services.

viding current preventive care by keeping abreast with new dental materials, through workshops provided by corporate companies, and contemporary oral health promotion and communication strategies provided by LHD conferences and professional associations. The training included management of dental caries, periodontal disease and Motivational Interviewing.

"Most adolescents present with complex dental issues, white spot lesions that require high fluoride toothpaste or… [use of enamel remineralising agents] for stabilisation, get that going before addressing the restorative work, yes, that's an enabler" (FG3).

"It was helpful to use skills such as Motivational Interviewing with adolescents…" (FG1).

Conversely, not all participants had received training in MI techniques. Most participants thought more training and development in behaviour management and counselling skills would enhance their effectiveness in delivering oral health education to patients.

'Up skilling to work effectively with adolescents, 'what is the teenager's motivator', the psychology behind it all" (FG1).

Educational chairside tools and resources

The majority of participants suggested using the patients presenting oral health status as a starting point to provide preventive care at the chairside. Most reported using the Tri- disclosing solution as an educational tool to encourage behaviour change.

"Being able to show the plaque with disclosing solutions gives them a visual presentation" (FG3).

Another participant used a different technique to illustrate the dental issues of their patients.

"I don't disclose, but I do scrape the plaque off their teeth and show them." (FG1).

Therapists who had access to digital cameras took intra oral photographs of the patient's mouths. They reported this made providing advice more personally relevant and important to their patients. It also helped with follow-up to determine if behaviour had changed.

The scope to apply different communication and coaching strategies to reach patients and families was a motivator for others. Trialling and using different approaches with adolescents and gaining positive results provided them with confidence.

"… if you can educate the eldest child then they become the role model for others and makes your work much easier" (FG3).

However, resourcing of preventive care strategies was inconsistent across the LHDs and within local clinics. They stated that the lack of age appropriate oral health education materials needed to be addressed. Participants also wanted consistency around the distribution of fluoride toothpaste, toothbrushes and remineralising agents for adolescents within LHDs.

"You need to make access to preventive products easier, toothbrushes, fluoride toothpaste like Neutra-Fluor 5000, Tooth Mousse, floss etc." (FG1).

"We need phone based APPs for today's teenagers, how to brush teeth, fun and attractive to this age group" (FG1).

Although policys existed to direct provision of preventive care, participants indicated that there was a need for LHDs to provide specific adolescent evidence-based guidelines with clinical presentations for use at chairside. This strategy could encourage consistent preventive care offered to adolescents by clinicians across the LHDs, with opportunities for unusual case study discussions.

"There is a need for shifting of policy and work place culture to continuing education to include evidenced-based preventive philosophy" (FG3).

Psychosocial factors

Engaging and creating a respectful working relationship with adolescent patients was paramount for all participants. They referred to their ability to recognise psychosocial problems such as depression taking medication and fear of dentistry as an impetus for them to reach out to vulnerable adolescent's and invest clinical time to provide preventive care.

"I use the patient's social and medical histories to inform my clinical practice and decision-making" (FG1).

Most participants referred to adolescents' poor oral health, health literacy, and lifestyle factors, such as smoking, use of social drugs, binge drinking and high consumption of sweet drinks, and the long-term impact as triggers or motivators for them to offer preventive care.

"… adolescents don't realise that what they are doing [energy drinks, smoking, alcohol, drugs] will have an impact on them later…. Huge problem. I try to get them to brush a bit more regularly, modify what they are doing now."(FG1).

"You start to relate to them, like young adults. [You ask them] to start thinking about long term economic value. I always point out to them if their teeth have to be fixed, they are going to be fixed again. It doesn't matter whether its five to ten years down the track, it will cost money unless they do something about it. That's money that can be put towards a car. At least they get that" (FG2).

Vulnerable adolescents had other distinctive social needs such as transient family structures, family dynamics, failure to attend appointments and relying on others for transport that required attention and support to ensure uptake of consistent health messages impacted on provision of preventive care.

"Changes in family structure, family dynamics, demands changing all the time, parents leaving children for longer periods. It does impact on their access to services, keeping their appointments and their ability to improve their toothbrushing or diet habits" (FG1).

Working in collaboration with other allied health agencies for example dieticians and NSW population health agencies was suggested as a strategy to increase the oral health promotion support network for Therapists and adolescents.

"Improved referral pathways to dieticians, health promotion school programs and local city council youth programs are potential support networks" (FG1).

This strategy was already used in some LHDs, however, was not sustainable and supported by all participants team members.

"We have done a lot of work to break down those barriers. [...] does a lot of community education, and it involves dental assistants, but still some dental assistants don't want to get involved. One of the key reasons we are able to provide preventive care is because it's supported by oral health promotion activities" (FG2).

Government Policies

Despite their ethical inclination and best efforts to provide preventive care, most participants indicated the strong emphasis of the NSW Health triage system and policies to prioritise emergency situations, provide relief of pain and restorative treatment impacted on the ability to provide preventive care.

"It's a Relief of Pain Driven service, that's the priority" (FG1, FG2, FG3)

There was inconsistency in the responses to 'sufficient time' for providing preventive care. Management restriction of follow-up appointments and recall systems in some local settings for monitoring patients was a constraint for some participants.

"We are not allowed to have recall systems, and appointment sessions are prioritised for Call Centre use" (FG1 and FG2).

Further, the majority of Therapists reported that their appointment sessions were too short to deliver effective preventive care. The use of MI was seen as a potentially valuable tool to enhance behaviour change but only a few participants had sufficient time allocated to provide this more in-depth preventive care.

"Adolescents need lots of appointments, longer appointments. The confidence and ability to provide treatment followed by preventive care, or combined, is professionally satisfying… " (FG3).

These participants understood the importance for multiple and longer follow-up appointments to address vulnerable adolescents' complex dental needs. Although time consuming, when the participants achieved positive results from challenging patients they reported it was professionally rewarding and built their confidence in managing adolescents with diverse needs.

"Sometimes using preventive care appointments can build my patients confidence, before, in-between or after doing any extensive treatment. They gain confidence to improve, in turn it builds my own confidence in my clinical approach" (FG3).

However, only a few participants stated they had sufficient time for this more in-depth level of care as follow-up appointments and duration of sessions were restricted and limited for others.

Dental Benefits Schemes

The Australian Commonwealth Government Medicare Teen Dental Program provided disadvantaged adolescents (at risk of dental disease) whose families are eligible for Family Tax A, a preventive voucher that could be used in private and public dental services [38]. The voucher in some LHDs enabled participants to fast track adolescents to dental care. Some participants reported that it funded extra clinical sessions for adolescents.

"Team Leaders manage adolescent waiting lists, create rosters, tag appointments, homing into preventive care sessions for Therapists. Managers approve this as they are monitoring lists

effectively and raising revenue from the Government voucher scheme" (FG1).

Local team leaders taking charge of improving adolescents access to preventive services was perceived as an enabler. The generation of revenue swayed some managers to give approval. Participants suggested these funds could assist the purchase of preventive care resources such as high fluoride toothpaste for their adolescent patients with active dental caries. However, the majority of participants were unsure of the funding and accountability processes within their LHDs to purchase these resources for patients with active decay.

Professional Leadership and Teamwork

Some participants, new to the public health system, stated that working alongside experienced clinicians was valued because the latter provided them with practical knowledge on the management of adolescents' oral health problems. A few participants reported that the clinical graduate programs to support the application of academic knowledge and skills in the workplace were an enabler to maintain the quality of clinical practice.

"Once every 6 months we have a peer review with our professional leader, present different cases, and make sure that you're doing alright". (FG3)

Most participants stated that team collaboration with a seamless link to management was important for fostering clinical learning environments ensuring continuous quality care for patients.

"There are opportunities for teams to make a difference at multiple levels within public health, creating learning environments in the workplace" (FG2).

The majority of participants commented on the importance of management support and approval for allocated time for team building activities, such as clinical forums, clinician reflection time, and opportunities for clinical case study discussions as essential enablers to embed preventive care philosophies. However, such activities are rare and somewhat ad hoc; with some reporting that it was leadership personality-type driven.

"We should all be involved to be informed, new materials and approaches to preventive care. Clinical Director, managers and clinicians should have regular clinical forums, we used to have them and they were very motivating, but, that Senior Dental Officer left…" (FG2).

Discussion

This qualitative study used a focus group design to engage and explore in-depth viewpoints of Therapists in four LHDs in NSW on the factors influencing them to offer preventive care to adolescents. Caution should be used in the interpretation of these data as the sample cannot be considered representative of all Therapists employed throughout NSW. Nonetheless, the influencing factors reported in this study provides a range of valuable topics that should be used to inform the development of models of care for health service improvement [17].

The strong preventive focus of participants in this study suggests that there has been a shift towards less interventionist dental care. Participants endeavoured to maintain balance between their professional ethos to meet the high demand for the relief of pain, provide prescribed scientific based preventive care [4, 24, 26, 29, 39] whilst adhering to various arms of NSW Health Policies [40]. Researchers have employed various approaches to improve clinical practice including professional education and development, audits and feedbacks, evidence-based guidelines, total quality management, economic incentives and organisational changes [41,42]. Cabana et al [43] review of public health services identified barriers to physician's adherence to practice guidelines and at least one barrier to compliance to clinical practice, clinical policies or national strategies; for example physicians exhibited various levels of awareness of the asthma guidelines or measles immunisation guidelines. However, studies on enhancing physician compliance may not be generalizable as obstacles identified in one setting may not exist in another [42, 43].

Satur, et al. [20] reported that due to greater demand in rural areas for urgent dental treatment including emergencies, less preventive care was being offered to patients. The authors found that irrespective of where Therapists practiced: 76.3% regularly provided preventive care and dental health education; 74.6% dietary counselling; prophylaxis 69.5%; scaling 67.8%; and more than half of the participants were offering pit and fissure sealants. Whilst our study did not record data in this detail, all the participants were providing these items of preventive care.

Moynihan and Kelly's [14] review reiterated that dental caries progresses with age and the effects of sugars on the dentition are lifelong, indicating the importance of offering dietary advice throughout a patient's life course. This is particularly critical during the adolescent developmental life phase. Participants in this study adopted scientific approaches for the management of their patients; however constraints beyond their control like system administration factors, impacted on their ability to provide appropriate levels of preventive care for patients.

The Australian Institute of Health and Welfare [44] report Australia's Health 2014, indicated oral disease as one of the four most expensive preventable chronic diseases to manage ($8.3 billion), which accounted for 6.3% of health spending. Furthermore, the NSW Health Centre for Epidemiology and Evidence [45] reported that dental disease was the fourth condition where hospitalization (16, 426 patients) could have been avoided for the years 2012 to 2013. Dental disease leading to hospitalization may have been avoided if appropriate preventive care and early disease management was provided through primary health care settings [45]. Despite challenges within the health system, participants in this study strongly advocated for a major shift towards a preventive care philosophy; balancing limited resources to address relief of pain type services. Creating a culture of 'learning' among professional team members at multiple levels, inclusive of LHD oral health executive members to address high demands for dental care for long term health outcomes was suggested by participants. Chen et al [46] highlighted health workers steadfast motivation and dedication to social commitment to overcome global health crisis, despite hardships, negative economic and system reforms further supporting the notion that human force drives health-system performance. Our study, although on a much

smaller scale, found that public oral health clinicians' professional ethos enabled them to make concerted efforts to combat dental disease for disadvantaged patients whilst trying to adhere to National and State oral health promotion and preventive strategies [13,17].

This study found that community oral health promotion strategies underpinned by preventive care in clinical settings was a strategy used to address barriers for adolescents oral health behaviours. These efforts are aligned with NSW State healthy weight initiatives, tobacco control and diabetes interventions [17]. However, health service management approval and team support was essential. We found that where team leaders took charge of administrating appointment rosters inclusive of preventive sessions, participants were able to execute preventive strategies more readily for their patients. This issue has been noted in other health disciplines, for example Marshall and Altpeter [47] reported that social work education for the aged needed to be underpinned with leadership training for interested individuals to enhance their roles in health promotion. Although not directly suggested by participants in this study, cultivation of oral health professionals to provide local leadership in clinical preventive and oral health promotion strategies may be an incentive and enabler to improve provision of preventive care to patients.

Leadership in organisations has been recognised as significant in influencing practitioner's perceptions, reactions and acceptance to enhancements in evidence-based practices [48]. According to Aarons [48], there is a link between organisational characteristics, individual differences and attitudes toward work, alluded to in this study. Brocklehurst, et al. [49] discussed the importance of transformational leadership in dentistry as a process to improve service delivery and provision of quality health care for patients. The recent NSW Health reforms saw the installation of the Agency of Clinical Innovation (ACI) and strengthening of the Clinical Excellence Commission (CEC) and Health and Education Training Institute (HETI). These three 'pillars' are to assist LHDs build local clinical leadership capacity thus enabling them collaborate effectively with clinical teams to provide improved models of health care [17].

Participants in our study mostly suggested professional development as a strategy to address a number of identified variations in the provision of preventive care by clinicians. Campbell and Tickle [50] don't disagree, rather, they suggested a multifaceted approach with a focus on quality improvement at macro, meso and micro levels of service delivery. They delineated the notion of quality of care in dentistry and provided two methods to quality improvement, one which is the Plan, Do, Study, Act (PDSA), a method also adopted by the CEC [17]. Marguolis et al's [51] randomised study of private paediatric and family practices across two regions in North Carolina combined continuing medical education and the PDSA cycle methodology to improve office administration processes for delivery of preventive care (immunisation and screening for tuberculosis, anaemia and lead). After thirty months there was noticeable increase in the proportion of children up to date with preventive services in intervention compared with control groups (screening for tuberculosis 54% v 32%, lead 68% v 30%, and anaemia 79% v 71%). This suggests that LHDs oral health key stakeholders should encompass State Health integral pillars: ACI, CEC and HETI as fundamental mechanisms towards clinical quality improvement. Furthermore, the strategies should be inserted in oral health core business and made transparent to oral health teams.

Considering the psychosocial factors of patients and families, participants in this study expressed a need for two main areas of professional development, first psychology and behaviour management of adolescents and second health counselling for parents/carers during clinical sessions to support them towards self-efficacy. Furthermore, oral health teams may benefit from in-services on adolescents health literacy as consumers of health care systems as reported by Massey et al [52]. This is aligned with Wallerstein [53] advocacy for community empowerment for youth towards health improvement. Therefore it would be prudent for LHD health service managers to approve and empower clinical staff to access HETI MI on-line module during clinical time as a commitment to National and State oral health promotion and preventive care strategies [17].

The Government Preventive Scheme [38] for eligible disadvantaged adolescents and families enabled some LHDs to provide extra rostered preventive sessions and appointments for participants. This addressed some of the clinical time constraints for participants to access adolescents and provide preventive care. Researchers [54] have suggested collaboration and strengthening of relationships between physicians and non-clinicians to provide 'illness care' and 'wellness care'. Our study found utilisation of Dental Assistants and working in collaboration with community and allied health professionals adopting Common Risk Factor approaches for smoking cessation, obesity and chronic disease as positive strategies to increase preventive and health promotion activities in LHDs.

With improved LHD local processes, it appears that participants may capitalise on Government Benefit funds to purchase much needed resources such as fluoride toothpaste of different strengths and remineralising agents to assist adolescents towards oral health self- efficacy as supported by Bardal et al's [55] study with adolescents undergoing orthodontic treatment.

Conclusion

Therapists endeavour to facilitate provision of preventive care and advice for adolescents accessing the public health system, but reported overwhelming factors that impact on performing these services. A multifaceted approach for directors and managers to assist Therapists offer timely and appropriate preventive care to adolescents' accessing public oral health services are therefore suggested.

Competing Interests

The authors declare that they have no competing interests. The authors are responsible for the content of this study and do not reflect the views of the NSW Ministry of Health or the funding Agency.

Acknowledgements

Funding Source: NSW Ministry of Health Rural and Remote Allied Health Professional Scholarship Scheme.

Special thanks to Hunter New England, Murrumbidgee, Southern NSW and South Eastern Sydney Local Health Districts Oral Health Service Clinical Directors, Directors and Oral Health Promotion Coordinators for approval and support for the project. Appreciation to Dental Therapists and Oral Health Therapists for their willingness to participate in the focus groups and to Jennifer Noller, Public Oral Health Consultant for her professional advice.

References

1) Watt RG (2005) Strategies and approaches in oral disease prevention and health promotion. Bull World Health Organ 83: 711-718.

2) National Advisory Committee on Oral Health (2004) Healthy Mouths Healthy Lives: Australia's National Oral Health Plan 2004–2013. Australian Research Centre for Population Oral Health, Adelaide.

3) Spencer AJ, Armfield JM, Slade GD (2008) Exposure to water fluoridation and caries increment. Community Dent Health 25: 12-22.

4) Wong MC, Clarkson J, Glenny AM, Lo EC, Marinho VC (2011) Cochrane reviews on the benefits/risks of fluoride toothpastes. J Dent Res 90: 573-579.

5) Armfield JM (2010) Community effectiveness of public water fluoridation in reducing children's dental disease. Public Health Rep 125: 655-664.

6) Armfield JM, Spencer AJ, Brennan DS (2009) Dental health of Australia's teenagers and pre-teen children. The Child Dental Survey, Australia 2003-04. Australian Institute of Health and Welfare, Canberra.

7) Skinner J, Johnson G, Phelan C, Blinkhorn A (2013) Dental caries in 14- and 15-year-olds in New South Wales, Australia. BMC Public Health 13: 1060.

8) American Academy of Pediatric Dentistry (2010) Guideline on Adolescent Oral Health Care. Clinical Guidelines 34: 137-144.

9) Broadbent JM, Thomson WM, Poulton R (2006) Oral health beliefs in adolescence and oral health in young adulthood. J Dent Res 85: 339-343.

10) Clerehugh V (2008) Periodontal diseases in children and adolescents. Br Dent J 204: 469-471.

11) Dugmore CR, Rock WP (2003) The progression of tooth erosion in a cohort of adolescents of mixed ethnicity. Int J Paediatr Dent 13: 295-303.

12) Tickle M, Milsom KM, King D, Blinkhorn AS (2003) The influences on preventive care provided to children who frequently attend the UK General Dental Service. Br Dent J 194: 329-332.

13) Lee JY, Divaris K (2014) The ethical imperative of addressing oral health disparities: a unifying framework. J Dent Res 93: 224-230.

14) Moynihan PJ, Kelly SA (2014) Effect on caries of restricting sugars intake: systematic review to inform WHO guidelines. J Dent Res 93: 8-18.

15) Waterhouse PJ, Auad SM, Nunn JH, Steen IN, Moynihan PJ (2008) Diet and dental er osion in young people in south-east Brazil. Int J Paediatr Dent 18: 353-360.

16) Australian Health Ministers' Advisory Council (2001) Oral health of Australians national planning for oral health improvement: final report. Steering Committee for National Planning for Oral Health AHMAC, South Australia.

17) Centre for Oral Health Strategy NSW (2013) Oral Health 2020: A Strategic Framework for Dental Health in NSW. Department of Health, Sydney.

18) Centre for Oral Health Strategy NSW (2008) Profile of the Dental Auxiliary Workforce in NSW. Department of Health, Sydney.

19) Ford PJ, Farah CS (2013) Oral health therapists: what is their role in Australian health care? Int J Dent Hyg 11: 22-27.

20) Satur J, Gussy M, Mariño R, Martini T (2009) Patterns of dental therapists' scope of practice and employment in Victoria, Australia. J Dent Educ 73: 416-425.

21) Nash DA, Friedman JW, Kavita RM, Robinson PG, Satur J, et al. (2012) A Review of the Global Literature on Dental Therapists. In the Context of the Movement to Add Dental Therapists to the Oral Health Workforce in the United States.

22) Arrow P (2007) Incidence and progression of approximal carious lesions among school children in Western Australia. Aust Dent J 52: 216-226.

23) Evans RW, Dennison PJ (2009) The Caries Management System: an evidence-based preventive strategy for dental practitioners. Application for children and adolescents. Aust Dent J 54: 381-389.

24) Davies RM, Blinkhorn AS (2013) Preventing Dental Caries: Part 1 the scientific rationale for preventive advice. Dent Update 40: 719-720, 722, 724-726.

25) Jenson L, Budenz AW, Featherstone JD, Ramos-Gomez FJ, Spolsky VW, et al. (2007) Clinical protocols for caries management by risk assessment. J Calif Dent Assoc 35: 714-723.

26) Levine AB, Stillman-Lowe C (2009) The scientific basis of oral health education (6th edn). BDJ, London.

27) Yevlahova D, Satur J (2009) Models for individual oral health promotion and their effectiveness: a systematic review. Aust Dent J 54: 190-197.

28) Clarkson JE, Young L, Ramsay CR, Bonner BC, Bonetti D (2009) How to influence patient oral hygiene behavior effectively. J Dent Res 88: 933-937.

29) Ahovuo-Saloranta A, Hiiri A, Nordblad A, Mäkelä M, Worthington HV (2008) Pit and fissure sealants for preventing dental decay in the permanent teeth of children and adolescents. Cochrane Database Syst Rev: CD001830.

30) Berg-Smith SM, Stevens VJ, Brown KM, Van Horn L, Gernhofer N, et al. (1999) A brief motivational intervention to improve dietary adherence in adolescents. The Dietary Intervention Study in Children (DISC) Research Group. Health Educ Res 14: 399-410.

31) Centre for Oral Health Strategy NSW (2006) Fluorides - Use of in NSW. Ministry of Health, Sydney.

32) Centre for Oral Health Strategy NSW (2009) Smoking Cessation Brief Intervention at the Chairside: The Role of Public Oral Health/ Dental Service. Ministry of Health, Sydney.

33) Centre for Oral Health Strategy NSW (2013) Pit and Fissure Sealants: Use of in Oral Health Services NSW. Ministry of Health, Sydney.

34) Australian Dental Association Inc (2013) The Australian Schedule of Dental Services and Glossary (10th edn). Australian Dental Association Inc, Sydney.

35) O'Leary Z (2004) The Essential Guide to Doing Research. Sage, London.

36) Minkler M, Wallerstein N (2003) Community-Based Participatory Research in Health. Jossey-Bass Publishers, San Francisco.

37) Braun V, Clarke V (2006) Using thematic analysis in psychology. Qualitative Research in Psychology 3: 77-101.

38) Australian Government Department of Human Services (2012) Medicare Teen Dental Plan. Department of Human Services, Australia.

39) Featherstone JD, Doméjean S (2012) The role of remineralizing and anticaries agents in caries management. Adv Dent Res 24: 28-31.

40) Centre for Oral Health Strategy NSW (2008) Priority Oral Health Program and List Management Protocols. NSW Health Department, Sydney.

41) Grol R, Wensing M (2004) What drives change? Barriers to and incentives for achieving evidence-based practice. Med J Aust 180: S57-S60.

42) Cheater F, Baker R, Gillies C, Hearnshaw H, Flottorp S, et al. (2009) Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes (Review). Cochrane Database Syst Rev, John Wiley & Sons, New Jersey.

43) Cabana MD, Rand CS, Powe NR, Wu AW, Wilson MH, et al. (1999) Why don't physicians follow clinical practice guidelines? A framework for improvement. JAMA 282: 1458-1465.

44) AIHW (2014) Australia's health 2014. Cat. no. AUS 178. Australian Institute of Health and Welfare, Canberra.

45) Centre for Epidemiology and Evidence (2014) Health Statistics New South Wales. Centre for Epidemiology and Evidence, Sydney.

46) Chen L, Evans T, Anand S, Boufford JI, Brown H, et al. (2004) Human resources for health: overcoming the crisis. Lancet 364: 1984-1990.

47) Marshall VW, Altpeter M (2005) Cultivating social work leadership in health promotion and aging: strategies for active aging interventions. Health Soc Work 30: 135-144.

48) Aarons GA (2005) Measuring provider attitudes toward evidence-based practice: consideration of organizational context and individual differences. Child Adolesc Psychiatr Clin N Am 14: 255-271.

49) Brocklehurst P, Ferguson J, Taylor N, Tickle M (2013) What is clinical leadership and why might it be important in dentistry? Br Dent J 214: 243-246.

50) Campbell S, Tickle M (2013) How do we improve quality in primary dental care? Br Dent J 215: 239-243.

51) Margolis PA, Lannon CM, Stuart JM, Fried BJ, Keyes-Elstein L, et al. (2004) Practice based education to improve delivery systems for prevention in primary care: randomised trial. BMJ 328: 388.

52) Massey PM, Prelip M, Calimlim BM, Quiter ES, Glik DC (2012) Contextualizing an expanded definition of health literacy among adolescents in the health care setting. Health Educ Res 27: 961-974.

53) Wallerstein N (2006) What is the evidence on effectiveness of empowerment to improve health? Copenhagen, WHO Regional Office for Europe (Health Evidence Network report; accessed 01 February 2006).

54) Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL (2003) Primary care: is there enough time for prevention? Am J Public Health 93: 635-641.

55) Bardal PAR, Olympio KPK, de Magalhaes Bastos JR, Henriques JFC, Buzalaf MAR (2011) Education and motivation in oral health - preventing disease and promoting health in patients undergoing orthodontic treatment. Dental Press J Orthod 16: 95-102.