Determining Liverpool adolescents’ beliefs and attitudes in relation to oral health

E. Stokes¹*, A. Ashcroft¹ and M. J. Platt²

Abstract

Poor oral health is an important public health issue. Adolescents represent a challenging group in terms of oral health because they have vulnerable permanent teeth erupting at a time when they are establishing their independence from parental influence. Preventing oral disease by attempting to influence the behaviours that impact adversely on oral health requires an understanding of the attitudes and beliefs that underpin those behaviours. Very few studies have investigated adolescents’ attitudes and beliefs in relation to dental issues. This study aimed to examine the attitudes and beliefs of adolescents towards dentistry and oral disease in order to inform future health promotion interventions. Data were collected through focus groups involving 22 13- to 14-year-olds from selected secondary schools in Liverpool. A thematic analysis was applied to the data. The themes identified illustrated the attitudes and beliefs of adolescents in relation to oral health and demonstrated how adolescents justify and personally operationalize these attitudes and beliefs. A need to encourage this group to take action to perform oral health behaviours was demonstrated.

Introduction

Oral diseases are significant in terms of personal suffering and financial burden for both individuals and society [1]. In the United Kingdom, success in reducing levels of oral disease over the last few decades has occurred largely due to the widespread use of fluoride toothpaste. However, in some areas including Liverpool, the prevalence of oral disease has remained relatively high [2–4].

The two most common oral diseases are dental caries and periodontal disease and they often begin in childhood [1]. The permanent dentition erupts between the ages of 7 and 13 years [5] and it is difficult to clean thoroughly when partially erupted, raising the risk of caries at initial full eruption [6]. The early signs of periodontal disease are also prevalent in adolescents [7]. In addition, adolescents may be at risk of developing tooth wear [8]. The risk behaviours for dental caries, periodontal disease and tooth wear include frequent intake of sugary food and drinks, irregular toothbrushing, smoking, alcohol consumption and irregular dental attendance [1]. These common behaviours could be habitual from early childhood or be initiated during adolescence related to an emerging autonomy from parental influence. Indeed, adolescence is a crucial period of transition [9–11] with personal responsibility for preventing dental disease beginning at this age and determining future oral health [12, 13]. Therefore, adolescents could benefit from oral health promotion interventions given at this developmental stage. Such interventions require an understanding of adolescents’ attitudes, beliefs and behaviours in relation to their oral health.
Good oral health is a part of general health and is influenced by diet and dental care behaviours, clinical support and adjacent health behaviours such as smoking. However, in the absence of an understanding of how adolescents view oral health as distinct from general health, this work focuses on understanding attitudes adolescents have towards oral health specifically. As such, the key behaviours investigated are consumption of sugary foods and drinks, toothbrushing and dental attendance, known to be the three key elements in maintaining good oral health. Questions posed were purposely related to these aspects in order that this study could understand fully their role in oral health in this age group. Smoking and alcohol consumption are more complex behaviours and investigation of these was seen as too broad for this study.

The precise nature of the relationship between health-related attitudes, beliefs and behaviours is complex [14]. Social cognition models have been used to inform the current research because they explain how health-related behaviours may be related to beliefs and attitudes.

Previous research in this field shows that adolescents consider toothbrushing to be central to personal grooming, rather than dental health, and that toothbrushing behaviours are influenced by family and peers [15]. Differences in toothbrushing habits in 14- to 15-year olds have been related to social group, gender, self-esteem, lifestyle variables (time of getting up, breakfast and bedtime) and reason for brushing (brushing for cosmetic reasons being associated with less frequent brushing than brushing for health reasons) [16]. These studies used questionnaires to obtain information on self-reported behaviours. However, understanding attitudes to oral health in a group as under-researched as adolescents requires more than one approach. A qualitative approach may develop greater understanding of the attitudes and beliefs that can influence the development of dental disease in adolescents. Furthermore, a qualitative approach is a good first step on which to develop a specific questionnaire about oral health for adolescents.

**Research question**

What are the attitudes and beliefs of adolescents in relation to dentistry and oral disease and how do adolescents operationalize these attitudes and beliefs?

**Aim**

This study aimed to examine the attitudes and beliefs of adolescents towards oral health and oral health-related behaviours.

**Method**

Ethical approval for this study was granted by Liverpool Children’s Research Ethics Committee and the study was conducted in accordance with the Central Office for Research Ethics Committee (COREC) regulations.

**Theoretical background**

The theoretical background for the study was drawn from social cognition models and a literature search on oral health, the process of adolescence and adolescents’ attitudes and beliefs in relation to oral disease. The following social cognition models were used: the Health Belief Model (HBM) which demonstrates how individuals weigh up the advantages and disadvantages of a health behaviour before taking action [17]; the Theory of Planned Behaviour (TPB) which describes how intentions to perform particular behaviours are formed [18] and the Health Locus of Control (HLC) which suggests that individuals may regard their health as being either under their own control or under the control of other powerful individuals [19]. These three models represent different types of social cognition models in that the HBM describes behavioural influences, the TPB attempts to predict behaviours and the HLC offers one specific explanation for health behaviours. Previous work has demonstrated that using this combination of models to study oral health behaviours is of value [20].
Study design

Focus groups can explore the knowledge and experiences of a small group in relation to a specific topic. This approach allows the researcher to investigate what people think, how they think and why they hold certain attitudes [21]. Interviews would not have facilitated participants to develop their ideas through interactive group discussion [22]. Questionnaires are an alternative effective means of accessing people’s attitudes about a topic. However, the absence of a well-developed psychometric tool about oral health for this age group led the researchers to consider a focus group approach to develop a model of adolescents’ attitudes which could later inform development of a questionnaire.

Questions for guiding focus groups

The literature search was used to identify potentially relevant themes for informing the design of focus group questions. The search revealed a limited number of studies that had specifically examined the attitudes of adolescents towards their teeth. The main themes described by the literature are outlined in Table I. The social cognition models were also used to inform focus group questions (Table II). The HBM informed questions that considered perceptions of susceptibility, severity, motivation, benefits and barriers; questions from TPB considered beliefs about outcomes, attitudes towards behaviours, subjective norms and perceived behavioural control and the HLC provided questions on participants’ perceptions of who controlled their behaviours.

Questions covered six main themes (dental visits, perceptions of healthy and unhealthy teeth, tooth cleaning, diet, caring for teeth and the relative importance of teeth) and were used to guide, rather than to direct, the discussion (Table II). Therefore, the moderator allowed the group to deal with issues as they were raised and used phrases to stimulate further discussion, such as ‘Can you tell us more about that?’ and ‘Could you explain?’ This suited the exploratory nature of the research [36]. The questions were piloted prior to their use by running a test focus group with three volunteers.

Table I. Themes potentially relevant to adolescent dental health, identified in dental, psychological and sociological literature

<table>
<thead>
<tr>
<th>Themes identified from dental, psychological and sociological literature [9–12, 15, 16, 23–35]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes towards dentists and dental visits</td>
</tr>
<tr>
<td>Responsibility for dental care</td>
</tr>
<tr>
<td>Relative importance of teeth compared with other health priorities</td>
</tr>
<tr>
<td>Justifying unhealthy behaviours</td>
</tr>
<tr>
<td>Cost considerations</td>
</tr>
<tr>
<td>Reasons for caring for teeth</td>
</tr>
<tr>
<td>Perception of self</td>
</tr>
<tr>
<td>Health beliefs and behaviours</td>
</tr>
<tr>
<td>Variations in attitudes and behaviours related to socioeconomic and lifestyle variables</td>
</tr>
<tr>
<td>Influence from peers and parents</td>
</tr>
</tbody>
</table>

Planning the focus groups

Groups were planned to involve Year 9 pupils, accessed through secondary schools in Liverpool. Teenagers of this age (13–14 years) have formed close links with peers, are concerned with image, are relatively independent from their parents and have sufficient vocabulary, comprehension skills and maturity to contribute in discussions [9, 22, 26, 27]. Groups were to have six to eight participants [22]. Participants within groups were to share some characteristics in order to assist in sharing experiences [37]. Therefore, children within individual groups were to be from the same school, of the same year group and of the same gender. Suggested guidelines on the duration of focus groups involving children (≤60 min) were adhered to [22]. Participating children were to be from a variety of cultural and socioeconomic backgrounds in order to ensure that a diverse selection of beliefs was sourced, which would be useful for the purpose of developing theory [38].

Procedure

Three schools were selected to take part in the study based on their different socioeconomic profiles (Table III). Teachers were requested to select children from a range of backgrounds, who would
Table II. Questions used for guiding focus group discussions

**Question one**
What do you think people of your age think about going to visit the dentist?
The first question involved dental visits because this is what people often talk about, and many people hold an opinion about dental visits.
Source: Literature, Medical model, TPB
*Follow-up on this theme:*
How do people your age feel about going to the dentist for a check up and how do people your age feel about going to the dentist for dental treatment, e.g. filling/tooth out?
Source: Literature, TPB
How often do you think that people should visit the dentist?
Source: Literature, Medical model

**Question two**
How can you tell if someone has unhealthy teeth and how do you feel when you see people with unhealthy teeth?
This set of questions went before the questions on diet and toothbrushing, to avoid prompting
Source: TPB
*Follow-up on this theme:*
How important to people your age is it to have healthy teeth?
Source: Literature, HBM
Can you think of any ways that you can help to prevent unhealthy teeth?
Source: Literature, Medical model

**Question three**
How important to people your age is cleaning their teeth? Why?
Source: Literature, HBM, TPB
*Follow-up on this theme:*
How often should people brush their teeth? What makes people remember to brush their teeth?
Source: Literature, Medical model, HBM, HLC
What do you feel about people who do not brush their teeth?
Source: TPB

**Question four**
How do you think that what you eat affects how healthy your teeth are?
Source: Literature, Medical model, TPB
*Follow-up on this theme:*
In your experience, how easy is it to get or buy healthy foods and drinks if you want them?
Source: TPB, HLC, HBM
How do you feel about cutting down on sugary foods in order to prevent tooth decay? How do you feel about reducing sugary drinks?
Source: Medical model, TPB, HLC

**Question five**
How have people of your age learnt to look after their teeth?
Source: Literature, HLC
*Follow-up on this theme:*
Who influences the way you look after your teeth?
Source: Literature, HLC

**Question six**
Are teeth important to people of your age? Can you think of some things that are more and some things that are less important than teeth?
Source: Literature, HBM
enter into discussion rather than be intimidated by the focus group paradigm, while ensuring minimum disruption to the school timetable. The sampling strategy was therefore a combination of purposiveness (for selecting schools and guiding the selection of pupils) and convenience (for selecting pupils). This strategy attempted to ensure that children were accessed from a variety of socio-economic backgrounds [39].

Parent and participant information consent and assent forms were given to teachers to distribute to selected pupils. The number of returned forms and absenteeism from school determined the number of respondents in each focus group.

The focus groups

Twenty-two Year 9 pupils participated. There were four groups held in three schools (Table III). Groups lasted up to 35 min. A longer time interval between the second and third groups was used to identify emergent themes and consider and consolidate the effectiveness of the approach used in the first two groups. The final focus group did not produce any new themes.

The author-researcher moderated the focus groups with assistance from a colleague. The primary aim of the group moderator was to create a non-judgemental and comfortable environment for subsequent discussions [40]. Therefore, the format of the groups was such that following informal chatting to put participants at ease [41], the researcher made introductions and described the purpose of the research and the format of the session. The researcher explained that participants’ feelings about issues were important, that there were no right or wrong answers [22] and that participants’ contributions would be anonymous. Groups were requested to respect each others’ views and to talk one at a time [41]. Each participant was asked to introduce themselves and tell the group what they enjoyed doing when they were not at school. The main purpose of the introduction was that each respondent had the opportunity to speak prior to beginning the discussion. It was anticipated that this warm-up would improve group dynamics and increase the confidence of those who felt reluctant to speak in the group situation [42]. Following these introductory comments, the tape recorder was switched on with the permission of the respondents and the formal discussion began. Time was made available at the end of each session for discussion and questions directed by participants themselves.

Data analysis

The focus groups were tape-recorded and transcribed. Transcripts were initially coded manually, whereby themes were identified by exploring the transcripts systematically and considering how each section of text might explain how participants made sense of dental issues. Many themes emerged from the data through this process. Some themes surfaced directly from the questions asked in the focus groups and others emerged from the resulting discussion. All the themes were collated and considered separately from the transcripts. Because many of the themes identified were closely related to one other, a comparative technique was used to reduce and organize these themes [43]. This involved passing through the list of themes manually several times and making comparisons and connections and resulted in 28 themes arranged under eight categories. This cyclical analysis was continued until no further themes could be identified or connected. Transcripts were coded with the final themes using QSR NUD*IST Vivo software to assist in data management, sorting and retrieval [44]. Use of this software allowed the researchers to analyze the data effectively.

Table III. Location and composition of focus groups involving Year 9 students in Liverpool, November 2002

<table>
<thead>
<tr>
<th>School type</th>
<th>Participants</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent school</td>
<td>8</td>
<td>Male</td>
</tr>
<tr>
<td>Comprehensive school sourcing children from a variety of home backgrounds</td>
<td>2</td>
<td>Female</td>
</tr>
<tr>
<td>Comprehensive school in a disadvantaged area</td>
<td>7</td>
<td>Female</td>
</tr>
<tr>
<td>Comprehensive school sourcing children from a variety of home backgrounds</td>
<td>5</td>
<td>Male</td>
</tr>
</tbody>
</table>

E. Stokes et al.
to easily access all the data relating to any particular theme and validated the original coding.

Coding of the transcripts was verified by three independent individuals from different academic backgrounds (psychology, social science and microbiology). They were each given a set of the final themes and asked to apply these to the transcripts. They were also asked to suggest new themes if necessary. Differences in opinion were resolved by consensus discussion.

**Reproducibility, reliability, validity and generalizability**

This study used systematic processes and full methodological accounts to enhance its reproducibility [45]. Reliability was ensured by employing investigator triangulation and having three of the transcripts coded by second raters [46]. The second raters’ codings were matched with the original coding and new codes identified by the second raters were incorporated into the coding scheme. Validity of the study was checked using data triangulation, i.e. by comparing the results obtained with evidence produced from different sources and by different methods [45, 46]. The literature review confirmed that some of the findings duplicated previous work. Novel findings will be tested for validity in future research. Further validation was provided through the complete examination of ‘negative’ or ‘deviant’ cases [45]. Purposive sampling in selecting schools and individual pupils assisted the generalizability of this study [47]. However, this work was not intended to be reproducible to a wider population, rather it was a step towards developing a wider quantitative tool with good reliability. The study aimed to understand the attitudes towards oral health of the adolescents studied.

---

**Results**

The focus groups generally operated effectively, with participants contributing willingly and interacting both with the moderator and among themselves. The excerpt below taken from the start of the third focus group provides an example of this interaction:

Moderator: What do people your age think about going to visit the dentist?

Scared of it.

It’s nothing scared like, but it’s, it’s horrible, he sticks his fingers in your mouth.

And it smells funny.

Moderator: Okay, any other thoughts?

And it’s bad because they might tell you something you don’t want to hear like you’ve got to have a brace or something.

Yeah mine.

Or needles.

Because, because when you’re thirteen you’ve got to they like get more strict and your braces make them straighter.

I’ve got to get a brace... next week.

Data analysis revealed 28 themes (i–xxviii). These were grouped into eight categories (A–H) according to commonality (Table IV).

**Conceptualization and value placed on healthy teeth (A)**

Themes within this category were derived from the second focus group question and from the resulting discussion (Table II). Participants did not tend to view healthy teeth as being integral to general health. Instead, they commented that healthy teeth were less important than their general health (vi):

Overall health is more important than your teeth.

It’s no worth having like nice teeth but like ’er a decaying body.

Teeth were felt to be important mostly in terms of their contribution to image (iii). However, while some respondents considered image solely in terms of appearance, others believed that teeth contributed to an *overall* impression of oneself:
I think it’s important because it makes you look like a nicer person, not like a nicer person but it makes you look nicer on your face.

It’s a thing about image ... you want to look after your teeth well, give a good image ... increase confidence around people.

Participants also discussed other reasons why healthy teeth were important (iv), including avoiding suffering teasing or pain, not wanting to have dentures and the cost of future dental treatment and eating:

You get some jibb (teasing) if your teeth aren’t nice.

You can get toothache if you’ve got bad teeth.

If you have them out at our age, it means you are going through life with false teeth.

You have got to go back to the dentist all the time and you end up paying.

They are quite important because like they help you eat.

There was disagreement about whose responsibility it was to keep teeth healthy (i, ii), with some respondents aware of their own role in ensuring that their teeth were healthy and others relying on parents, the dentist or even their friends:

You’re old enough to do it yourself now.

---

**Table IV. Main categories and themes identified from focus groups involving Year 9 students in Liverpool, November 2002**

<table>
<thead>
<tr>
<th>Main categories</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Conceptualization and value placed on healthy teeth</td>
<td>i. Awareness of responsibility for self</td>
</tr>
<tr>
<td></td>
<td>ii. Reliance on others to be responsible</td>
</tr>
<tr>
<td></td>
<td>iii. Healthy teeth and image</td>
</tr>
<tr>
<td></td>
<td>iv. Other reasons why healthy teeth are important</td>
</tr>
<tr>
<td></td>
<td>v. Use of personal experience to explain healthy behaviours</td>
</tr>
<tr>
<td></td>
<td>vi. Relationship between oral and general health</td>
</tr>
<tr>
<td>B. Conceptualization and reaction to unhealthy teeth and behaviours</td>
<td>vii. Tolerance of unhealthy teeth</td>
</tr>
<tr>
<td></td>
<td>viii. Unhealthy teeth and image</td>
</tr>
<tr>
<td></td>
<td>ix. Making sense of unhealthy teeth or behaviours</td>
</tr>
<tr>
<td></td>
<td>x. Use of previous experience to explain how unhealthy teeth can motivate individuals to perform healthy behaviours</td>
</tr>
<tr>
<td>C. Marketing and ‘teeth as commodities’</td>
<td>xi. Trade-off of consequences of current actions and commodification</td>
</tr>
<tr>
<td></td>
<td>xii. Awareness of marketing</td>
</tr>
<tr>
<td></td>
<td>xiii. Cost assessments</td>
</tr>
<tr>
<td>D. Attitudes and awareness of dentistry</td>
<td>xiv. Attitudes to dental visits and treatments</td>
</tr>
<tr>
<td></td>
<td>xv. Awareness of dental treatments</td>
</tr>
<tr>
<td></td>
<td>xvi. Using previous experience to explain attitudes to dentistry</td>
</tr>
<tr>
<td>E. Health beliefs and behaviours</td>
<td>xvii. Motivators and blocks to health behaviours</td>
</tr>
<tr>
<td></td>
<td>xviii. Sources of learning and influence on health beliefs and behaviours</td>
</tr>
<tr>
<td></td>
<td>xix. Health knowledge</td>
</tr>
<tr>
<td></td>
<td>xx. Current and future dental care</td>
</tr>
<tr>
<td>F. Peer group judgement or effect</td>
<td>xxi. Negative</td>
</tr>
<tr>
<td></td>
<td>xxi. Positive</td>
</tr>
<tr>
<td>G. Perception of self</td>
<td>xxiii. Self-esteem</td>
</tr>
<tr>
<td></td>
<td>xxiv. Self-efficacy</td>
</tr>
<tr>
<td></td>
<td>xxv. Self-perceived oral health</td>
</tr>
<tr>
<td>H. Components of social cognition models</td>
<td>xxvi. HBM</td>
</tr>
<tr>
<td></td>
<td>xxvii. TPB</td>
</tr>
<tr>
<td></td>
<td>xxviii. HLC</td>
</tr>
</tbody>
</table>
It’s usually up to the parents and they just can’t be bothered.

There was a tendency for comments to be reflected back to, or justified by, recollections of personal experience (v). Thus, when participants considered what constituted healthy behaviours or what were the triggers for healthy behaviours, they tended to draw on their own experiences:

It made me brush them more (having had to have teeth extracted).

**Conceptualization and reaction to unhealthy teeth and behaviours (B)**

Themes within this category were largely derived from the second question in the focus group schedule (Table II). Participants often spoke strongly about the unacceptability of unhealthy teeth and behaviours (vii, ix):

It makes me sick when you see people with brown teeth.

Loads of girls our age are into smoking an’ that now an’ it just wrecks their teeth.

They also linked unhealthy teeth with teasing, and expressed concerns that if they had unhealthy teeth, they might be teased:

They’d be messin’ an’ stuff an’ say look at your teeth.

Unhealthy teeth were also perceived as being important for image (viii):

When they were talking to you it would put you off.

In relation to image, respondents mainly discussed unhealthy teeth in terms of their appearance, although halitosis was also mentioned:

Yellow plaque.

Black and rotted.

Brown or yellow.

Red gums.

Their breath would smell an’ everything.

In addition, participants questioned the overall personal hygiene of people with unhealthy teeth:

If they didn’t clean their teeth, do they actually wash?

Participants also attempted to explain unhealthy teeth and/or behaviours (ix):

I’ve got horrible teeth because I forget to brush them sometimes.

If you got a boyfriend with brown teeth you think they smoke or something.

Again, this illustrates a tendency to reflect on personal experience to explain their own reaction to, or justification of, unhealthy teeth or behaviours (x). There were also a few negative cases, where respondents stated that unhealthy teeth were not a problem:

It doesn’t really bother me.

**Marketing and ‘teeth as commodities’ (C)**

The themes within this category were derived from discussion rather than directly from the focus group questions. Respondents demonstrated an awareness of marketing and cost in relation to teeth and healthy behaviours (xii, xiii).

They’re not in your face saying drink water.

They’re (healthy foods) usually more expensive as well.

In addition, there was evidence of individuals identifying with teeth as a commodity (x), and succumbing to the temptation of sweets while being aware of the health risks was an example of this:

It’s easy to buy them (healthy foods) but they don’t taste as nice and it’s not as tempting as a packet of crisps or sweets.

Thus, respondents were using their teeth to achieve a different objective than health.
Attitudes to and awareness of dentistry (D)
Themes within this category originated from the first focus group question (Table II). Respondents discussed their attitudes towards dental visits and treatments (xiv):

Scared, I hate getting me teeth out.
The dentist doesn’t bother me.

There was also awareness among respondents of a number of types of dental treatments, including examinations, restorations, extractions, orthodontics, cosmetic treatments, dentures and fissure sealants (xv):

I had my check-up.
I’ve never had a filling.
I hate getting my teeth out.
I might need braces soon.
They probably bleached their teeth though.
I don’t want when ‘yer thirteen getting false teeth.
You get your teeth coated.

In addition, participants were aware of the role of the dentist in dental health education:

If you got told by the dentist (to cut down on sugary drinks) then it would seem like more important.

In common with the themes discussed above, there was a tendency to relate attitudes towards dentistry to personal experience (xvi):

When I go for a check up I’m not bothered but when I have to go and get something done to my teeth, I’m scared.

Health beliefs and behaviours (E)
Themes within this category were derived from the first five focus group questions (Table II). Participants generally had a good level of oral health knowledge and demonstrated knowledge of what constituted healthy behaviours (xix):

Brush them all the time and go to the dentist every six months.
Sugar dissolves them.
Use dental floss.

Participants also articulated what motivated or prevented them from performing these behaviours, e.g. habit, recall cards, their parents or a taste in the mouth (xvii):

I do them in the morning just before I go to school, and then just before I go to bed, so I don’t usually forget.
They send like a card.
It’s usually up to the parents.

When you wake up in the morning ... ’yer mouth tastes all horrible.

In addition, respondents considered how they had gained their health knowledge and beliefs (xviii). Sources included parents, dentists, teachers, friends, pop stars, science books and leaflets. Participants also demonstrated awareness of planning their future dental care (xx):

I’ve got to go back in six months.

Peer group judgement or effect (F)
This theme was derived from all the focus group questions. It was an important theme because of the importance attributed to peer influence in the psychological and sociological literature but not in the dental literature. It was possible to separate peer judgement or effect into negative (xxi) and positive (xxii):

They play jokes on you, they say like are your teeth cold? An’ if you say no they say look at that yellow blanket (plaque).

If like say your mate was smoking or something and like they, like they tried to get you smoking or something like that.

You might think I want my teeth to be like theirs.
Your friends are really there to help you as well aren’t they?

Positive judgements and effects were less common than negative.

**Perception of self (G)**

This theme was identified in responses to all the focus group questions as respondents commonly reflected on their own experiences when answering questions (Table II). The theme demonstrated three aspects: self-perceived oral health (xxv), self-esteem (xxiii) and self-efficacy (xxiv). The code ‘self-esteem’ was applied when participants considered issues that would impact adversely on their self-esteem and to statements that described how teeth could increase self-esteem:

I’d be thinking to myself ‘oh are my teeth horrible?’

I’d be thinking that, that I’ve got like, little scabby teeth or something.

You want to look after your teeth well, give a good image and also increase confidence around people.

Self-efficacy was discussed in relation to a range of health behaviours including toothbrushing, diet and dental visits. Participants demonstrated a range of self-perceived capabilities in relation to these behaviours:

You just get into the habit of ye brush your teeth and it’s just a habit.

In school … all the drinks they have is fizzy.

People don’t usually go to the dentist ’cos like it’s usually up to the parents and they just can’t be bothered going.

Comments regarding self-perceived oral health were both positive and negative (xxv):

My teeth are like quite healthy.

I went ’cos my teeth were like they were getting minging.

**Components of social cognition models (H)**

Components of the social cognition models were identified directly from the focus group questions (Table II). Respondents demonstrated all the components of the HBM (xxvi). For example, participants described their perceptions of their susceptibility to oral disease:

Once you lose your baby teeth they erm they don’t rot as easy as the other ones.

I always eat sweets and my teeth are like quite healthy.

Participants also articulated their perceptions of the potential severity of oral disease:

You feel ashamed because like say like one of your mates go urghh look at their teeth and then you think have I got teeth like that.

I think it’s important because it makes you look like a nicer person, not like a nicer person, but it makes you look nicer on your face.

Motivating factors for health behaviours were also described:

People might think oh your teeth are like horrible so your gunno like start brushing them or somethin’.

That (pictures of unhealthy teeth in science books) just makes you wanna go home and brush your teeth.

Participants also discussed their perceptions of the benefits of and barriers to performing health behaviours:

’Cos of your appearance.

They should sell more like healthy foods, like in the canteen, they don’t always sell (healthy food).

Scared, I hate getting my teeth out.

Overall, use of the HBM in this work illustrated how participants appeared to weigh up the
perceived advantages and disadvantages of particular behaviours before acting.

The TPB also proved useful in explaining the data (xxvii). Most of the comments pertinent to the TPB related to dental visits rather than other dental health-related behaviours. This probably reflects the necessary longer term planning involved in arranging a dental visit rather than brushing one’s teeth or controlling diet:

You don’t know what is going to happen when you go there.

It’s horrible, he sticks his fingers in your mouth.

Data also revealed subjective norms concerning dental visits:

Go to the dentist every six months.

Unless there is something wrong with you, you’ve got a toothache.

Perceived control over dental visits was generally poor:

People don’t usually go to the dentist ‘cos like it’s usually up to the parents and they just can’t be bothered going.

Relating data to the HLC revealed how the concept of locus of control also had the potential to explain these adolescents’ dental health-related behaviours (xxviii). For example, some participants illustrated an internal locus of control in relation to toothbrushing:

It’s only you that can make you brush them.

If you are our age, you don’t actually expect your mum to say like go and brush your teeth.

An external locus of control was illustrated in relation to dental visits and healthy eating:

If you got told by the dentist then it would seem like more important.

The people that make the stuff that you eat and drink (who are responsible for causing tooth decay).

Overall, these results successfully answer the research question. They illustrate the attitudes and beliefs of adolescents in relation to dentistry and oral disease and describe how adolescents attempt to justify and personally operationalize these attitudes and beliefs.

Discussion

The study found that participants had a good knowledge of the aetiology and prevention of oral disease and were aware of many different professionally applied dental treatments. Appropriate oral health behaviours identified by participants included twice-daily toothbrushing, limiting sugar intake and regular dental visits. Participants were also aware that smoking impacts oral health, although they tended to mention smoking as a cause of discoloured teeth in their peers rather than as a cause of periodontal disease or oral cancer. Pupils expected their peers to engage in healthy behaviours even though they were often unwilling or unable to carry them out themselves. In particular, it was unacceptable to participants that their peers should suffer from the image-related consequences of poor oral health, such as decayed teeth, poor oral hygiene and malodour. Pain was only rarely described as being an unacceptable consequence of unhealthy oral health behaviours. The failure of participants to carry out key oral health behaviours was related to a number of issues, such as lack of time, forgetfulness, the unattractiveness or unavailability of healthy food and drink and taste preferences for less healthy food and drink.

The social cognition theories applied in this research are useful in interpreting how the themes identified in this study might act as influential factors that mediate oral health behaviours:

The HBM suggests that health behaviours are a result of individuals considering the benefits of and barriers to performing a particular behaviour. Although participants were aware of their potential susceptibility to oral disease, the benefits of engaging in healthy behaviours were not perceived as a sufficient reason for action. Therefore, appropriate
oral health behaviours were not practised, despite possible unacceptable consequences. However, participants expected others, their peers, to take action and prevent the same consequences. The HBM helps to explain this incongruence between participants’ expectation of others engaging in preventative behaviours compared with their own less healthy behaviour.

Referencing to norms was very important to the study population and both the TPB and the HBM explain the importance of norm referencing to understanding health behaviours. In this study, respondents frequently referenced their beliefs and attitudes according to peer beliefs. Yet, they did not apply the same standards and expectations to their own behaviour. The group of pupils involved in the study were young adolescents who may still hold an egocentric view of themselves. Therefore, they acknowledge peer expectations and apply them to others but exclude their own behaviour from these standards. It is likely that older adolescents would be more conforming and would ensure that their own behaviour is consistent with their peers. Respondents also referenced parental beliefs in relation to either historical events, such as how participants had learned to clean their teeth, or to events perceived to be outside respondents’ control (HLC), such as arranging dental visits. This dual referencing (to peers and parents) demonstrates the emerging, although incomplete, independence of the study group. Perceived normative beliefs can influence individual behavioural intentions (TPB) and in this study peer normative beliefs could be important precursors to health behaviour (HBM). However, the data also demonstrate the importance of attitudes and behaviours about oral health being established at an early age when parental influence was most potent.

Comparing the results from this study with earlier qualitative research in this area reveals that some of the findings duplicate previous work. For example, previous studies found that adolescents generally considered teeth to be important because of their contribution to appearance rather than health [24, 25] (and that adolescents consider professional dental care as essential in preserving healthy teeth [25]. Other findings from the current study were novel and include the unequal standards applied by adolescents to healthy behaviours in themselves and in their peers, the influence of marketing in relation to oral health and the value of using social cognition models to interpret this type of data.

This study had some limitations. One issue was the small size of the second focus group. This was a result of absenteeism from school compounding the small number of consent forms returned. Nevertheless, the second group provided some useful data. It is possible, however, that the small size of this group restricted the development of the discussion and the exploration of themes. A further problem for this study related to its overall size, with only four focus groups and a total of 22 participants. This meant that comparative data analysis, e.g. between males and females, was not possible as most of the themes were identified from all four of the focus groups. It is encouraging that the fourth focus group produced no new themes, which indicates that data collection was saturated. The study was also limited in terms of the perspective it took in defining oral health. This perspective was selected in order to understand key oral health behaviours; therefore, this purposeful strategy was valid. It was apparent from the results that participants did not identify with oral health as part of general health. This aspect requires further study.

The results obtained in the current study indicate why certain healthy behaviours were not carried out by the adolescents studied. These results will inform the development of an attitudinal questionnaire. This will allow the attitudes of larger groups of adolescents to be investigated. Results from such a larger scale study should be used to provide a strong theoretical base for future oral health promotion interventions targeting adolescents. Current oral health promotion interventions aimed at adolescents often lack this theoretical underpinning.

The results of the current and future work may be particularly useful for oral health promotion in schools. Health promotion theory suggests that health promotion in schools should involve a
combination of approaches (building healthy public policy, creating supportive environments, strengthening community action, developing personal skills and reorienting health services) [48]. The results from the present study could be valuable across these approaches. Social cognition models should also be valuable in informing such school-based oral health promotion interventions.

**Conclusion**

This study used a strong theoretical base alongside existing literature to inform a qualitative investigation of the attitudes and beliefs of adolescents towards their teeth, dentistry and oral health. Themes identified by this study were related to selected psychological models. This allowed the authors to investigate the potential impact of participating adolescents’ beliefs about oral health behaviours.

Although this study took care to involve both male and female participants from a variety of socioeconomic backgrounds, the size of the study was limiting. Inclusion of more focus groups could have allowed more comparative analysis, for example between older and younger adolescents, between males and females and between individuals from different backgrounds. Further work is required to test the relevance of the findings in a wider population and to test the strength of the relationship between beliefs and behaviour.

**Acknowledgements**

This research was funded by GABA International AG.

**References**

23. Abell SC, Richards MH. The relationship between body shape satisfaction and self-esteem: an investigation of


44. QSR. *QSR Nvivo NUD*IST Vivo for Qualitative Research. Victoria, Australia, 2000.


Received on November 18, 2004; accepted on August 27, 2005