UNIVERSITY OF SOUTHERN QUEENSLAND

Parental and Teacher Influences on the Consumption of Plain Drinking Water by Primary School Aged Children

A dissertation submitted by

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Abstract

A rise in the rate of overweight and obesity in children coupled with an increasing availability and consumption of sweet drinks raises questions about the place or importance of plain water in a child's overall nutritional intake. In terms of influencing a child's nutritional behaviour, teachers and parents play a crucial role in educating, promoting and encouraging healthy behaviour whether that be in the home or school environment. Schools are seen to be an important setting for health promotion and as such, factors that promote healthy behaviour or barriers against it should be explored.

The primary aims of this study were to 1) investigate parents' and teachers' beliefs about water consumption by children whilst at school 2) investigate how parents and teachers perceive themselves as role-models in relation to water consumption in children; and 3) investigate parents' and teachers' self-reported behaviour in relation to their promotion of water consumption. This qualitative study was based upon Social Learning Theory and used an exploratory qualitative descriptive design. Using Pender's Health Promotion Model as a framework, data were collected from 9 participants in total (including 6 parents and 3 teachers). This included semi-structured interviews and a 24-hr Fluid Recall Form. Participants were from one regional primary state school.

Thematic analysis was conducted from the data, and 9 major themes were identified. The results indicated that parents and teachers rated a high importance of their child / student drinking water. Parents and teachers were unsure as to how much water their child / student was drinking each day, nor how much was recommended for them to drink. Some parents and teachers were more active in encouraging and

promoting water as a choice of drink, particularly in hotter weather or when children were active playing sport or doing Physical Education Classes. Parents and teachers reported a range of strategies that they used to encourage children to drink water and in the school setting, allowing children to have easy access to a water bottle in the classroom was seen as being positive. Some teachers were unsure what roles they could play in the school to promote water (if it was perceived as part of their role at all). In terms of perceptions of the current school water drinking facilities, many parents and teachers held negative views in terms of hygiene, location and maintenance.

Establishing a habit of drinking plain water was expressed as a difficult task by some participants, citing problems with remembering and taste preferences. Results from the 24-hr Fluid Recall Form supported the fact that many parents drank only small amounts of plain water. Those parents and teachers who did drink more water participated in regular exercise, and therefore their higher water consumption may be as a result of this.

A small number of parents made a connection between what fluids they consumed as a child and what they encourage their child to drink now. Some teachers hoped that by drinking water in front of children in the classroom that this might have a positive influence on the students.

It was concluded that the issue of water consumption in children is worthy of further investigation. There may be opportunities within the school to adopt a 'whole of school' approach whereby parents, teachers, students and the broader community work towards establishing and sustaining an environment which continues to promote healthy water drinking behaviours.

Certification of Thesis

I certify that the work contained in this thesis is original and that it contains no material written by another person, except where otherwise acknowledged. I also certify that the material has not been previously published, except where otherwise acknowledged, or submitted for any other award at any other higher education institution.

_____ _____

Lisa Beccaria Date

ENDORSEMENT

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A/Prof Roslyn Reilly (Principal Supervisor) Date

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Ms Victoria Parker (Associate Supervisor) Date

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CHAPTER 1: INTRODUCTION

As a school health nurse working with preschool and primary school aged children, I have personally witnessed a tendency for children's lunchboxes to contain sweet drinks including poppers, cordials and flavoured milks. Whilst I understand the importance of milk and juices and their contribution to a child's overall nutritional intake, I have not seen an obvious inclusion of water to form part of their school lunch. In my discussion with teachers about the issue of water consumption, most have appeared concerned about the increase in sweet drink consumption due to its effects on health, particularly relating to the rise in overweight and obesity.

Despite the reported benefits of good hydration (Haines, 2000; Shannon, 1996) concerns are raised from the literature that the consumption of sweet drinks continues to rise (Batch & Baur, 2005; Stubbs & Lee, 2004). This increased consumption has been suggested to have a significant negative impact on health, associated with problems of overweight and obesity (Dennison, Rockwell, & Baker, 1997; National Health and Medical Research Council, 2003b; Sports Dietitians Australia, 2003). This coupled with an apparent decrease in water consumption based on data from national nutrition surveys, is an important issue to consider as water forms an important part of a child's nutritional intake (Balding, 2004; Cook, 2001).

This chapter introduces the study by providing some background to the issue of water consumption and children. It will also outline the importance of the role that teachers and parents play in encouraging water intake. The research question and study aims will be provided. Finally, the study methodology and significance of the research will be discussed.

Background

It is recognised that early intervention strategies that target the early development of healthy behaviours (such as drinking water) are vitally important (Queensland Health, 2004). There have been a small number of programs developed in Australian schools to increase water consumption (Central Sydney Area Health Service, 1999; Queensland Health, 2003), however these do not appear to have been formally evaluated.

Some studies have found that poor access to clean drinking water, a lack of encouragement by teachers for children to access water at regular times, and the school's physical environment as problems for children to be able to drink an adequate amount of water (Balding, 2004; Petter, Hourihane, & Rolles, 1995; Walters & Cram, 2002).

Recognised as very influential in developing and sustaining a child's nutritional behaviours are teachers and parents (Neill & Allensworth, 1994). There is no research at present that has addressed their role as role models in supporting water-drinking behaviours, nor their attitudes towards water as a choice of drink for children.

Effective health promotion strategies for young children must ensure that both parents and teachers are committed towards strategies for healthy change (National Health and Medical Research Council, 1996). As part of this commitment, it is important to understand their attitudes and beliefs surrounding particular health behaviours. This may include gaining a better understanding of their own water drinking behaviours and how this may relate to children.

Aims of the Study

The aims of this study are therefore to:

1 Investigate parents' and teachers' beliefs about water consumption by children whilst at school;

2 Investigate how parents and teachers perceive themselves as role-models in relation to water consumption in children; and

3 Investigate parents' and teachers' self-reported behaviour in relation to their promotion of water consumption.

Research Questions

1) Do parents' and teachers' attitudes and beliefs about water have an influence on a child's water consumption?

2) Are parents' and teachers' self-perception as role models influenced by their own water consumption behaviour?

Study Parameters

This study involved parents and teachers of primary school aged children in one regional primary state school. Teachers and parents have been identified as very influential in developing and maintaining healthy attitudes and behaviours in young children and therefore are the focus of the study. Whilst there would certainly be merit in gaining a further understanding of children's attitudes and beliefs about water, this study has used previous related research findings to develop this study.

Study Methodology

This research is a qualitative study that recognises the value in understanding why people do what they do, so as to guide them towards a healthier change (Berglund, 2001; Steckler, McLeroy, Goodman, Bird, & McCormick, 1992).

This study was used an exploratory qualitative descriptive design. Pender's Health Promotion Model (based upon Social Learning Theory) was used to help explain why people behave or engage in particular health behaviour, and also to provide a framework for data collection (Pender, 1987). The use of this model assisted in not only focusing on an individual's thoughts, but also identified external factors, which may have an impact on health behaviours.

This study involved 9 participants in total (including 3 teachers and 6 parents). Participants were asked to record their own fluid intake. The purpose of the Fluid Recall Form was to assist in gaining a greater understanding as to whether their own water drinking behaviour has an influence on children.

Significance of the Research

An important part of a child's nutritional intake is what they drink. National nutrition surveys have indicated that children are consuming less than recommended daily amounts of water (Balding, 2004; Cook, 2001). We also know that children's overweight and obesity is partly contributed by an increase in sweet drink consumption (Stubbs & Lee, 2004). In Australia, there is a lack of research on the nutritional influences from parents and teachers and their impact on children in terms of fluid intake. The results of this study will assist in gaining a greater understanding of people's attitudes and beliefs specifically about water as a choice of drink, and

parents' and teachers' self perception about their involvement as role models to encourage children to drink water.

The significance is that good nutritional habits developed when a child is young, can have positive effects into adulthood (Queensland Health, 2004). By attempting to understand the influences from parents and teachers in a child's early years in terms of fluid intake, this may be helpful to develop strategies that may not only benefit them in the short term but into adulthood.

Thesis Structure

Chapter 2 is a literature review which overviews the effect of sweet drinks on children, outlines the benefits of good hydration on health, describes the current trends in water consumption, and also discusses identified barriers to water consumption in the school environment. The role of teachers and parents is also discussed, highlighting their importance in developing and maintaining children's healthy behaviours. Chapter 3 outlines the methodology of the study including the study design and methods of data collection. Chapter 4 presents the findings of the research from semi-structured interviews with participants and data collated from the 24- hour Fluid Recall Form. Chapter 5 provides a discussion of the results and their relationship with Social Learning Theory. And finally, Chapter 6 outlines limitations of the research and presents recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

Overweight and obesity has been described as the new 'global epidemic' and 'the most visible but neglected public health issue in the world' (Batch & Baur, 2005). In Australia, approximate figures for children cited in the literature in relation to the prevalence of overweight and obesity range from 5.3% to 20-25%, and figures seem to be rising (Batch & Baur, 2005). Of particular concern is the rise of overweight and obesity in the Indigenous community (National Health and Medical Research Council, 2003a).

Some of the possible contributing factors have been identified as an increased consumption of high fat / energy foods, an increase in television viewing, increases in food marketing strategies, an increase in use of video games and computers, a greater reliance on cars and public transport instead of walking or riding bikes, an increase in parental obesity rates, and a higher consumption of sweetened drinks (Batch & Baur, 2005; National Health and Medical Research Council, 2003a, 2003b; Stubbs & Lee, 2004; U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2005).

The impact of overweight and obesity on children's health has been identified as a key risk factor in preventable morbidity and mortality. Some of the common effects of obesity on children may include increased cholesterol levels, high blood pressure, raised insulin, joint problems (common in ankles and knees), breathing problems, snoring and sleep disturbances. Some psychosocial implications are teasing and possible bullying at school, social isolation and difficulty keeping up with peers (Sports Dietitians Australia, 2003). Many studies have found that the risk

of an obese child becoming an obese adult is high (National Health and Medical Research Council, 2003a).

The obvious long-term implication of this public health issue is its effect not only on individuals but also collectively on health services for the future. It is estimated that in developed countries overweight and obesity is accounting for 2 to 6% of total health care costs (World Health Organisation, 2006). As the problem of overweight and obesity is seen as preventable, this is certainly an area for immediate attention (National Health and Medical Research Council, 1997).

Many studies have focused on the issue of children's sweet drink consumption, including what types of drinks, and how much is consumed. In contrast, the literature for this study has focused on reviewing the benefits of drinking plain water. It outlines recommended daily consumption amounts of water and describes how much children consume. Furthermore, the role of parents and teachers as significant others in influencing nutritional behaviours is also highlighted. Finally, Social Learning Theory will be discussed as a foundation for providing an understanding of the social context of behaviour, which is important when examining the home and school environment.

Sweetened Drinks and their Contribution to Prevalence of Overweight and Obesity

An increase in the consumption of sweet drinks has been identified as a contributing factor to the risk of overweight and obesity in children primarily because it adds to the overall increase in total energy intake (Batch & Baur, 2005; National Health and Medical Research Council, 2003b; Stubbs & Lee, 2004). Dennison et al (1997) hypothesised that a rise in fruit juice consumption may be due to a number of factors. Firstly, there appears to be greater varieties of drinks on the

market. There also appears to be a perception by parents that they are a healthy and convenient choice of drink. It seems that juices are comparatively priced to milk and soft or carbonated drinks. Finally, national fruit marketing campaigns to increase fruit consumption may also be a factor.

Effects of Excessive Sugar Intake from Sweetened Drinks

If children drink large amounts of soft drinks, sports drinks, and fruit juices, the effects can include: 1) a reduction in their appetite because of a malabsorption of nutrients in the diet; 2) increased gastrointestinal problems such as loose bowel motions, bloating and abdominal pain; 3) increases in overall sugar intake; and, 4) sweeter drinks replacing other nutritious beverages such as milk (Dennison et al., 1997; National Health and Medical Research Council, 2003b). A reduction of appetite may result in children not eating enough nutritious food. This means that they may not be meeting their daily nutrient requirements important for growth and development (Dennison et al., 1997; Queensland Health, 2003). An increase in sweet drink consumption for teenagers has seen a reduction in milk consumption by 40%. This can have a negative effect on bone density which can increase the risk of fractures and osteoporosis (Hunter, Chestnutt, Evans, & Withecombe, 2004).

In terms of sweet drink consumption and water consumption, concerning is the belief from children that plain water is a poor choice compared with soft drinks due to a preference for sweeter flavours (Petter et al., 1995). This, coupled with the easy purchase of sweet drinks in schools, means that many children would prefer to drink sweet drinks as opposed to plain water (Brander, 2003). This availability of sweet drink supply is incongruent with promoting an environment that supports healthy choices (Hunter et al., 2004).

Another one of the problems with soft drinks is although they largely consist of water, they often also contain high levels of caffeine. Caffeine acts as a diuretic and therefore increases the rate of fluid loss from the body (Hunter et al., 2004). There is no evidence at present linking soft drink consumption with hydration status. However, it is arguable that as many children are not drinking enough water and are replacing water with sweeter drinks, their risk of dehydration may be increased (Bell & Swinburn, 2004; Brander, 2003; Hunter et al., 2004; WaterUK, 2005). Clearly this is an area for further research.

Well documented in the literature is the effect of sweet drinks on dental health by increasing the risk of dental caries (Dennison et al., 1997; National Health and Medical Research Council, 2003b; Watt, Dykes, & Sheiham, 2000). It is also noted that slow sipping, swishing before swallowing may lead to high acid production from bacteria which can contribute to dental erosion (National Health and Medical Research Council, 2003b). This can be seen with babies and toddlers with what is termed 'bottle caries'. It is arguable that drinks that have sippers or straws (ie.poppers) for older children may also have a similar effect.

Good Hydration and Health

Children's bodies contain approximately 60% water, which is necessary for maintaining bodily functions such as regulating body temperature, maintaining blood volume, assisting in the elimination of waste products and for intracellular functioning (Phipps, Long, Woods, & Cassmeyer, 1991).

Some benefits of good hydration have been cited and these include a reduction in bed-wetting problems particularly day-wetting, due to improvements in bladder capacity and less concentrated urine (Haines, 2000). Good hydration has the

longer-term effects of reducing the risk of colon cancer and improving cardiovascular health (McManus & Churchwell, 1994; Shannon, 1996). Mild dehydration on the other hand, can result in increased thirst, headaches, concentrated urine, poor concentration, diminished mental and physical performance, lethargy and irritability, dry skin and mucous membranes, elevated temperature and weight loss (Kleiner, 1999; McCance & Heuther, 1990).

It is therefore plausible that an adequate consumption of water will decrease the overall risk of dehydration, which may even lead to an improvement in attention and concentration (Brander, 2003). Balding (2004) states that there is a lack of firm evidence to suggest that increasing water consumption will have a positive effect on students' energy levels, concentration or behaviour.

However, when water strategies have been implemented in schools to increase consumption, teachers have reportedly noticed positive effects on students' ability to study and increased activity levels (WaterUK, 2005). A child who is not well hydrated can often display a lack of interest towards exercise and lethargy can result in a deterioration in mood which can effect mental performance (Hunter et al., 2004). D'Anci, Constant and Rosenberg (2006) conducted a review of studies in relation to hydration and cognitive function. Cognitive functioning was described as having several domains including memory functions, attention functions, perceptual functions, executive functions, psychomotor functions, and language skills. One study involving two groups of children (one hydrated and one dehydrated) based on urine osmolality, found that after a battery of cognitive testing, the group that was dehydrated performed more poorly in terms short term memory, making groups, number addition, and verbal analogies tasks. Other studies in adults have found that low to moderate levels of dehydration resulted in "significantly higher mood scores

for anger, confusion, and fatigue" (D'Anci et al, 2006). Taras (2005) conducted a literature review of nutrition studies and found that school breakfast programs resulted in a number of improvements. These included better verbal fluency, tests of attention, memory, creativity and cognitive and academic performance. This is noteworthy as clearly a child's nutritional intake including adequate water consumption may improve academic performance at school (Taras, 2005).

Recommended Water Consumption for Primary School Children

Children are at a greater risk of dehydration for a number of reasons, including: 1) having a smaller absolute surface area but greater surface area per unit mass (meaning that there is greater heat transfer to and from the body); 2) producing more heat per kilogram which places more stress on the body to regulate itself (children produce more heat but sweat less); and, 3) possessing immature sweat processes (so the body has more problems staying cool) (Burke & Deakin, 1994; Inge, 2000). The implication of this information in the school setting is that it is possible that many children do not appear 'sweaty', whereas children appearing 'sweaty' may normally have been an indicator that children need to drink more fluids. As another risk, children are also reliant on caregivers to provide them with an adequate provision of fluids (D'Anci et al, 2006).

Furthermore, it is argued that children need to be encouraged to drink water regularly (sipping) throughout the day and not only when the children might appear to be sweating or saying they are thirsty, or only in designated school meal breaks. When a child is thirsty, it is likely that they are already dehydrated (Queensland Health, 2003).

The message promoted in the Australian Dietary Guidelines for Children and Adolescents is that water should be the choice of drink. Brochures developed for the general public however, do not provide any information about recommended amounts of water for children (National Health and Medical Research Council, 2003b). The danger of parents or teachers encouraging too much water, can lead to a condition called hyponatremia. This is defined as a condition where there is a "less than normal concentration of sodium in the blood, caused by excessive water circulating in the bloodstream". "In a severe case, the person may develop intoxication with confusion and lethargy leading to muscle excitability, convulsions and coma" (Mosby's Dictionary: Medical, Nursing and Allied Health, 1990, p.595). Clearly, there is a need for improved dietary guidelines recommending daily amounts of water for children.

Children's Consumption of Water

Between 1985 and 1995, national nutrition surveys in Australia reported a significant increase in plain water drinking consumption (Cook, 2001). For children between the ages of 10 and 15 years, the mean intake for boys increased from 278 ml to 715 ml. For girls the mean daily intake increased from 260 ml to 727 ml. A standard glass / cup size is 250 ml, therefore the increases for girls and boys equates to approximately 1 glass consumed per day in 1985 compared with 2 ½ to 3 glasses of water a day in 1995 (Cook, 2001; Software, 1998-2004).

It is argued that methodological differences between the two surveys (ie the data collection and the types of questions asked and seasonal variations in 1985 and 1995) may have produced results that are not comparable. In terms of seasonal variation, climate has been identified as one of the most important influences on a

child's consumption of water (Zohouri & Rugg-Gunn, 2000). A study of 4 year olds in Iran found that dietary fluoride intake was significantly higher in summer than in winter. This meant that children drank more in summer than winter, and therefore their consumption of fluoride (which was supplemented in the water) was subsequently higher.

In relation to the two Australian surveys, because questions related to the total amount of water drunk in the day, it is not possible to determine how much of this was drunk at home or at school. It is therefore possible that children may have drunk water before school, not drunk much at school and gone home thirsty and then drunk a large amount.

The recommended water intake for children however between the ages of 10 to 15 years, is between 1.5 and 2 litres a day, with at least 3 to 4 cups of water being consumed at school during the day (Balding, 2004; Department of Health South Australia, 2005). This is important as the body continually loses water via breathing, perspiring, and going to the toilet. Despite the increase found in the national nutrition survey, children continue to consume less than the recommended daily intake.

Without analysing children's diets methodically, it is nevertheless important to have some guidance about what might be an adequate amount of water to encourage children to drink. Some would argue that children are probably getting enough water in their diet from foods such as fruit and vegetables, and that therefore there is no need for concern about how much they are consuming through drinking. Loughridge and Barratt (2005) state that "solid food, particularly fruit and vegetables can contribute about 1L of water per day". Some Australian studies however indicate that many children are not eating enough fruit and vegetables (Cashel, 2000; Cleland, Worsley, & Crawford, 2004) with about one in four children not eating vegetables

regularly. Nevertheless, some fruit and vegetables can contain approximately 80 to 90% water, except for dried products, and other solid foods can contain between 40 to 79% water (Central Sydney Area Health Service, 1999).

The literature therefore suggests that many children are not consuming enough 'water dense foods' such as fruit and vegetables, and therefore their overall water intake may well be inadequate. This further supports efforts for children to drink more water each day. One strategy recommended is that students should bring a water bottle from home and be allowed to drink this not only during break times but during the class as well (Brander, 2000).

Children's Fluid Preferences

When students were asked in a large UK study about what would encourage them to drink more water, their main responses were if 1) the water tasted better 2) if it was chilled or 3) if it was flavoured (Balding, 2004). This survey cited that although 85% of the population reported a liking for drinking water, the authors failed to distinguish whether this was the taste of school water, bottled water or possibly water brought from home. Loughridge and Barratt (2005) conducted a study in three secondary schools in a disadvantaged area (North Tyneside – UK). During a three month period, one school was given cooled filtered water and active promotion of water, another had water only, and the last group took part in post-intervention focus group work. They found that the provision of free cooled water in the cafeterias resulted in an increase in consumption by students in the group that had active promotion of drinking water.

D'Anci et al (2006) stated that the "act of drinking may not be directly involved with a physiological need for water intake, but can be initiated by habit, ritual, taste, or a desire for warm or cooling effect".

The taste associated with different waters has seen a rise in the popularity of bottled water. This may have had an effect by increasing in water consumption for some children (Cook, 2001). Perceptions about bottled water have been reported as having better taste than tap water, being safer particularly where there are high levels of bacterial contamination in the local water supply, and having become a trendy accessory for the health conscious (Parrott, Ross, Roberts, Wilson, & Woodard, 1998; Watson, 2004).

Concerns have been raised about the long-term effect of bottled water particularly toward dental health. As most bottled water does not contain any fluoride, there are movements towards ensuring that it is added to bottled water, therefore having a more positive effect on children's dental health (Armfield & Spencer, 2004). Despite not all areas within Australia having access to fluoridated water, fluoridated water still remains as one of the "most effective methods of reducing tooth decay" (D. Hall & Elliman, 2003). Therefore the more fluoridated water a child drinks the better dental protection is predicted.

In terms of characteristics of students who were more likely to drink water, they tended to be 'good students' or more 'diligent with their school work'. There were positive correlations between being more diet and exercise conscious, being diligent about school work, playing a musical instrument, wearing a hat for sun protection, and worrying about global issues such as war and terrorism, and an increase in water consumption (Balding, 2004).

During highly competitive sport, a study by Meyer Bar -Or, Salsberg, & Passe (1994) found that fluids were replaced more efficiently with sports drinks (grape and orange flavoured) as opposed to drinking plain water (Meyer, Bar -Or, Salsberg, & Passe, 1994; National Health and Medical Research Council, 2003b). Whilst the Australian Dietary Guidelines for Children and Adolescents supports for the use of sports drinks, the danger is that so called 'sports drinks' may be confused with 'energy drinks'. Energy drinks contain high caffeine levels and are therefore not recommended for children. In addition, sports drinks are not suitable for young children, but may be useful for older children who are involved with more competitive sports at a sustained vigorous level (Central Sydney Area Health Service, 1999). It is argued that these different messages could potentially be sending mixed messages about the importance and value of drinking water for the vast majority of school children.

Water in Schools

Walters and Cram (2002) examined water facilities in schools in the UK and found that many taps and water fountains were located in toilet areas and most were dirty, badly maintained, and highly contaminated. They found that the fountains that had a lower water pressure were more contaminated, presumably because of a greater contact with saliva, lips and fingers. Another study in the United States found similar results with water drinking fountains, finding that there were more microscopic germs on drinking taps than on toilets and door handles ("Millions of Germs and Bacteria Await Kids at School.," 2006). There is currently little evidence in Australia to examine the water quality of school water. In addition, there is also a

lack of literature exploring the attitudes and perceptions of students about the quality of water at school in Australia.

Not only is it important that children know that water is good for drinking, but children should feel that they can drink it when they need to. A strong predictor of whether children would drink more water was whether the teacher allowed children to access water whenever they wanted it. A study involving secondary students found that students reported some teachers being 'weary' of water being consumed in the classroom particularly around computers (Loughridge, 2005). Having water freely accessible in the classroom was a good predictor of children drinking more water more often (Balding, 2004). In Victoria, Out of School Program coordinators (426) completed a questionnaire examining staff offering water to children in after school care. Approximately 17% had offered children a drink of water, whereas approximately 24% had offered cordial / soft drinks and fruit juice (Thompson, 2006).

Children reported that if parents and teachers encouraged them to drink water, or if their friends drank water often, then they too would be inclined to drink (Balding, 2004).

School Health Promotion

When addressing health issues within large populations, such as schools, there needs to be the recognition between people's health and the way in which they interact with their environment. There has been an emergence of programs such as the Healthy Cities Program, Healthy Hospitals, Healthy Workplaces and also Healthy Schools which are based upon a 'settings approach' whereby health

promotion occurs almost in a community within a community (Baum, 1998; Egger, Spark, Lawson, & Donovan, 1999).

Criticisms of school-based health promotion have reported that traditional approaches have seen most programs focusing only on activities within the classroom (i.e., focusing on the curriculum). Interventions have appeared to be put in place despite being incongruent with current school policies, which affects the ability of the school to sustain change in the long term. In addition, programs were often tailored towards older children, arguably because they could read better and be better able to participate in the research or new interventions (National Health and Medical Research Council, 1996).

Furthermore, school health promotion has also as at times failed to incorporate the broader influences on a child's health such as family behaviours and choices, and the media (National Health and Medical Research Council, 1996).

The "H20 Fruit and Veg to Go" program (Queensland Health, 2003) focuses on children having easy access to good nutrition throughout the school day. Whilst this can be one type of strategy used, it is important to recognise and build into the school a culture that values and emphasises water as a healthy choice of drink. Therefore school strategies need to not only consider access to drinking water, but consider the broader human influences from adults and peers in establishing and maintaining positive changes. A number of health promotion strategies could include parent education, role modelling with water at home and in the classroom, general healthy marketing in the school and changes in the school tuckshop to only sell bottled water.

The World Health Organisation promotes a best practice "Health Promoting Schools Approach", which has also been adopted by Queensland Health and

Education Queensland. This uses a settings approach which incorporates three components 1) curriculum, teaching and learning 2) school organisation ethos and environment 3) partnerships and services (Queensland Health, 2004).

The UK's 'Food in Schools' web-based program is an excellent example of a 'Health Promoting Schools Approach'. It aims to inform the school community about the benefits of drinking water. A number of practical strategies include a step by step plan for schools to assess current water provision and ways to promote children drinking water at school (http://foodinschools.org).

Social Learning Theory

Bandura's Social Learning Theory (C. Hall & Lindzey, 1978) is based on the idea that human behaviour relates to the way in which people develop and maintain behaviours. Bandura believes that an individual's ability to learn can occur via positive role modelling (such as those potentially provided by parents and teachers), and that if people perceive a positive outcome they might be more likely to make a change. In the case of water consumption, if a child observes a role model drinking water and perceives that this will make the role model healthier, they begin to take on some new behaviors. This, in conjunction with the idea of some positive reward or outcome for the child if they drink it, may be enough to continue the new behaviour. An important part of the model is the idea that the person learns a behaviour through the observations of others and believes that they are in control of making a decision and that they have the skills or capacity to make a change (C. Hall & Lindzey, 1978).

The Social Learning Theory also emphasises the social context of behaviour change, in that people are influenced by others around them towards behaviours

through certain cues (C. Hall & Lindzey, 1978). Young children are greatly influenced by others in their environment. This can include peers, family members and the school environment. Promoting a positive social context in which children are encouraged to make healthy choices and rewarded for making a healthy choice are critical in developing and maintaining good nutritional habits (Baxter, 1998). As both parents and teachers have been identified as the most influential in promoting a healthy diet (Baxter, 1998) it is important to examine their role as role models in relation to the issue of water consumption. This will assist in better understanding behaviours, which are most likely to result in the development and maintenance of good water drinking behaviours in children.

Parental Influences and Nutrition

There is little research into adults' attitudes and behaviour towards drinking water. The Singapore Drinking Habits Survey found that most people surveyed were drinking less than the daily-recommended amount. Respondents cited forgetfulness, not wanting to use the bathroom, drinking only when thirsty and not knowing enough about importance of fluids, as reasons for why they did not drink enough fluids (Asian Food Information Centre, 2005).

There is no research that has directly looked at parental attitudes and behaviours and their contribution to children's water intake. Children's diets are largely influenced by their parents, particularly for younger children. As well as being nutritional role models, parents play several other key roles in facilitating good nutrition, including: 1) purchase and availability of healthy foods, 2) encouragement of healthy choices to their children, 3) nutrition education and participation with school initiatives, and 4) preparation of food (Department of Human Services

Victoria, 1998; Neill & Allensworth, 1994). As water forms part of a child's healthy diet, it is important to examine the parents' influence as role models in promoting and encouraging an adequate and healthy fluid intake (Haymarket Business Publications Ltd, 2004; Sports Dietitians Australia, 2003).

A whole of family approach has been highlighted as a successful strategy whereby parents are active in role modelling healthy behaviours (Sports Dietitians Australia, 2003). This has been the focus in family weight management programs where longer term change is achieved by modifying behaviour and ensuring that family strategies are developmentally appropriate (Batch & Baur, 2005; National Health and Medical Research Council, 2003a). Derived from this approach is the importance in recognising that parents are key leaders in nurturing healthy change. For this reason, parents have been identified as key in the issue of water consumption behaviours. Furthermore, concerns about family members' health problems was a predisposing factor in wanting to make dietary and lifestyle changes (Reed, 1996). Interestingly, this study highlights the father's role as a significant change agent to modelling healthy eating behaviour.

In addition to understanding attitudes toward healthy change, there is also recognition that nutrition knowledge is also important. The study by Reed (1996) found that many low-income mothers were experiencing cooking burnout, had a lack adequate knowledge about various developmental stages and also had difficulties translating dietary guidelines into practical menu selection ideas or food grocery lists. For water consumption, it is proposed that if parents value water as a choice of drink, and have a good knowledge about its benefits and recommended amounts, they may be more likely to encourage it with their children.

Parents may also need to recognise that the health issue is a problem or is an area for improvement to begin to make a healthy change. One study found that many parents often did not perceive their children as obese, and therefore parents were feeding them as children with a normal weight (Dennison, Erb, & Jenkins, 2001). In addition, a parent's own eating behaviours and choices coupled with the lack of concern has a significant negative impact on the choices available for the child (National Health and Medical Research Council, 2003a).

In summary, parents are important role models for their children in terms of developing and maintaining healthy behaviours. It is important to understand their nutritional knowledge and attitudes, as both behavioural change and attitudinal shifts toward better nutritional choices are necessary to evoke change (National Health and Medical Research Council, 1997).

Teacher Influences and Water Intake

Teachers are integral players in the process of increasing a student's knowledge of health issues, developing concepts and skills for physical activity and enhancing personal development, and making changes in the classroom to engage children in healthy behaviours (Egger et al., 1999; Yaussi, 2005). They also act as important role models for the children and can also facilitate health change within the school setting as an advocate on behalf of parents and children (Baum, 1998). Students can also perceive teachers as 'good teachers' who are the ones that model healthy behaviour, such as looking physically fit and joining in with physical activities (Cardinal & Cardinal, 2001).

Although many teachers acknowledge the importance and the need to address nutritional issues, they are faced with many barriers. Some of the barriers have been

cited as: (a) having a busy curriculum, (b) little perceived time to implement new programs, (c) limited training in nutrition issues, (d) an increasing threat of litigation which has had a negative impact on physical activity, (e) perception that control of food and eating environment is the parent's domain, and (f) having limited access to health support staff (National Health and Medical Research Council, 1996; Sutherland, Gill, & Binns, 2004).

Teachers may also see their role as providing nutrition information as part of the core curriculum rather than having a strong role in distributing nutritional information (Graham, Gibbons, Marraffa, & Sultana, 2000). Smolak, Harris, Levine and Shisslak (2001) stated that the best way to engage teachers in nutrition prevention programs was to provide them with nutrition information that they needed in useable forms, for example, pamphlets in relation to risk factors and how to help. Convincing teachers of the importance of the problem was also important, as too was the idea of utilising the school resource person (someone that they could go to ask for help), developing school policies and involving teachers in the development of specific curriculum (Smolak et al, 2001).

Despite health being seen as one of the major curriculum priorities, it is argued that it faces strong competition for curriculum time compared with other areas, and a lack of support staff and designated resources are also major factors towards greater implementation of initiatives (National Health and Medical Research Council, 1996; Queensland Health, 2004).

Creative teaching in some schools has been able however, to incorporate nutrition ideas into existing curriculum areas. James and Adams (1988) were able to successfully integrate nutrition information within a mathematics curriculum with

many practical strategies such as developing a grocery store which taught them about monetary issues, but also to teach students about food groups and healthy choices.

Supporting healthy choices in schools needs to move beyond curriculum focused interventions (National Health and Medical Research Council, 1996). It needs to be broader to also consider the culture of the school environment (National Health and Medical Research Council, 1996). As role models, teachers are looked up to by children and therefore have an obligation to model healthy eating behaviour.

Concerns have been raised about the teachers' own eating behaviour whilst at school, with many teachers reporting a 'low perceived personal health and low support for the school food environment' (Kubik, Lytle, Hannan, Story, & Perry, 2002). Where vending machines were present, one study found that approximately 62% of teachers used it to buy sweet drinks. In addition, almost three-quarters of teachers used sweet food rewards for positive behaviour in the classroom such as lollies (Kubik et al., 2002).

In summary, a child's school years are ones that are fundamental in developing attitudes, value and behaviours that will support healthy life choices when they are older. Teachers are integral players in the process of increasing a student's knowledge of health issues, developing concepts and skills for physical activity and enhancing personal development (Egger et al., 1999). They also act as important role models for the children and can also facilitate health change within the school setting as an advocate on behalf of parents and children (Baum, 1998).

CHAPTER 3: METHODOLOGY

Introduction

This study was aimed at exploring a number of factors in relation to children's water consumption. Firstly, it sought to understand attitudes and beliefs that parents and teachers held in relation to children's water consumption behaviour. To more comprehensively understand a child's nutritional behaviour, this study incorporated the important influences that parents and teachers have on children, acting as role models and significant others. The focus of this study was the school environment as this is often a setting for supporting the early development of healthy behaviours and education about nutrition. This study also recognized that the home environment is equally important for the development and encouragement of healthy behaviours.

The literature review identified that there has been a lack of research, which addresses the role of parents and teachers in terms of children's water consumption. As this is a new area to be explored in terms of children's nutrition, there is justification in exploring parents and teachers' own personal thoughts and experiences, to provide more indepth knowledge of their thoughts in relation to water, their perceived role in encouraging children to drink water and also to explore if their own water drinking behaviour has an influence on their child (in terms of the parent) or children that they teach (in terms of the teacher).

To be able to address the research question, this study required an approach that assisted in building new knowledge about why people do what they do. This is particularly useful when in a health promotion context the aim is to guide people towards a healthier change (Berglund, 2001; Steckler et al., 1992).

In light of this, an exploratory qualitative descriptive approach was chosen to be the most suitable in terms of gaining new knowledge from participants who would be able to share their perceptions, values, beliefs and knowledge. Understanding an individual's perceptions about how they see the world and how that forms their knowledge (factual or subjective) is the basis of a philosophical underpinning for nursing research.

This study is fundamentally based upon knowledge that is formed by the way in which we interact and experience the world around us. For many children much time is spent in two main settings, home and at school. Ways in which we can gather new ways of knowing can be from

1) revealed knowledge – caring for one another
2) intuitive knowledge – knowledge within a person, eg insight linked with consciousness
3) rational knowledge – formal logic and reason
4) empirical knowledge –formed from experiences or direct observations
5) authoritative knowledge – knowledge accepted in faith from eg teachers and parents (Munhall & Boyd, 1993).

In terms of children and what influences them, this development of 'new knowledge' has been structured to describe people's knowing and perceptions linked with their view of the world. This may include their own experiences, what others have told them, what experiences they or their children have had with the school environment, observations which may have lead to their own knowledge, and perceptions of other's authoritative knowledge.

Conceptual Framework

This study is underpinned by concepts from Social Learning Theory. Developed by Bandura (1977), the theory is based around the ideas that humans behave in certain ways as a result of interactions with others (C. Hall & Lindzey, 1978). This behaviour may be developed from others positively modelling behaviour and furthermore, for an individual to make change they need to perceive a positive outcome to enable them to make a healthy change (C. Hall & Lindzey, 1978).

In applying this theory to the idea of water consumption, if a child observed a role model (be that a parent or a teacher) drinking water, and perceived that their behaviour was positive, the child may perceive that they too may become healthy, and they then may be more likely to take on a new behaviour.

This, in conjunction with the idea of some positive reward (from a parent or teacher) eg. positive facial expressions or verbal praise, may be enough to continue the new behaviour. An important part of the model is the idea that the person learns a behaviour through the observations of others and believes that they are in control of making a decision and that they have the skills or capacity to make a change (C. Hall & Lindzey, 1978).

Whilst it could be argued that for young primary school aged children, making decisions and feeling like they have a capacity to make a change is developmentally challenging or unattainable, as role models, parents and teachers could be instrumental in providing support for children to learn healthy behaviours and learn to make better nutritional decisions with increasing age (Baxter, 1998).

Pender's Health Promotion Model

Pender (1987) developed a Health Promotion Model, which is based upon Social Learning Theory. The model is valuable because it 'helps to explain occurrences of health-promoting behaviour' (Pender, 1987). The main features of the Health Promotion model are that it incorporates 'cognitive-perceptual factors (individual perceptions), modifying factors, and variables affecting the likelihood of action' (Pender, 1987).

Cognitive–Perceptual Factors are defined as prime motivators for internal motivational change towards better health. They include a person's value of the importance of health, perceived control, perceived self-efficacy (defined as a person's belief that s/he can carry out the behaviour required to make the change), definition of health, perceived health status, perceived benefits of health-promoting behaviour, and perceived barriers to health-promoting behaviours (Pender, 1987).

Modifying factors such as demographics (eg age, sex, and ethnicity) were proposed to have an impact on the cognitive–perceptual mechanisms. For example, children exercise often for fun, whereas adults may exercise to reduce disease risk brought about by poor lifestyle. Biological characteristics, such as weight, have also been identified as having an impact on health promotion behaviour. For example, adults who are more overweight have higher drop out rates for exercise programs (Pender, 1987).

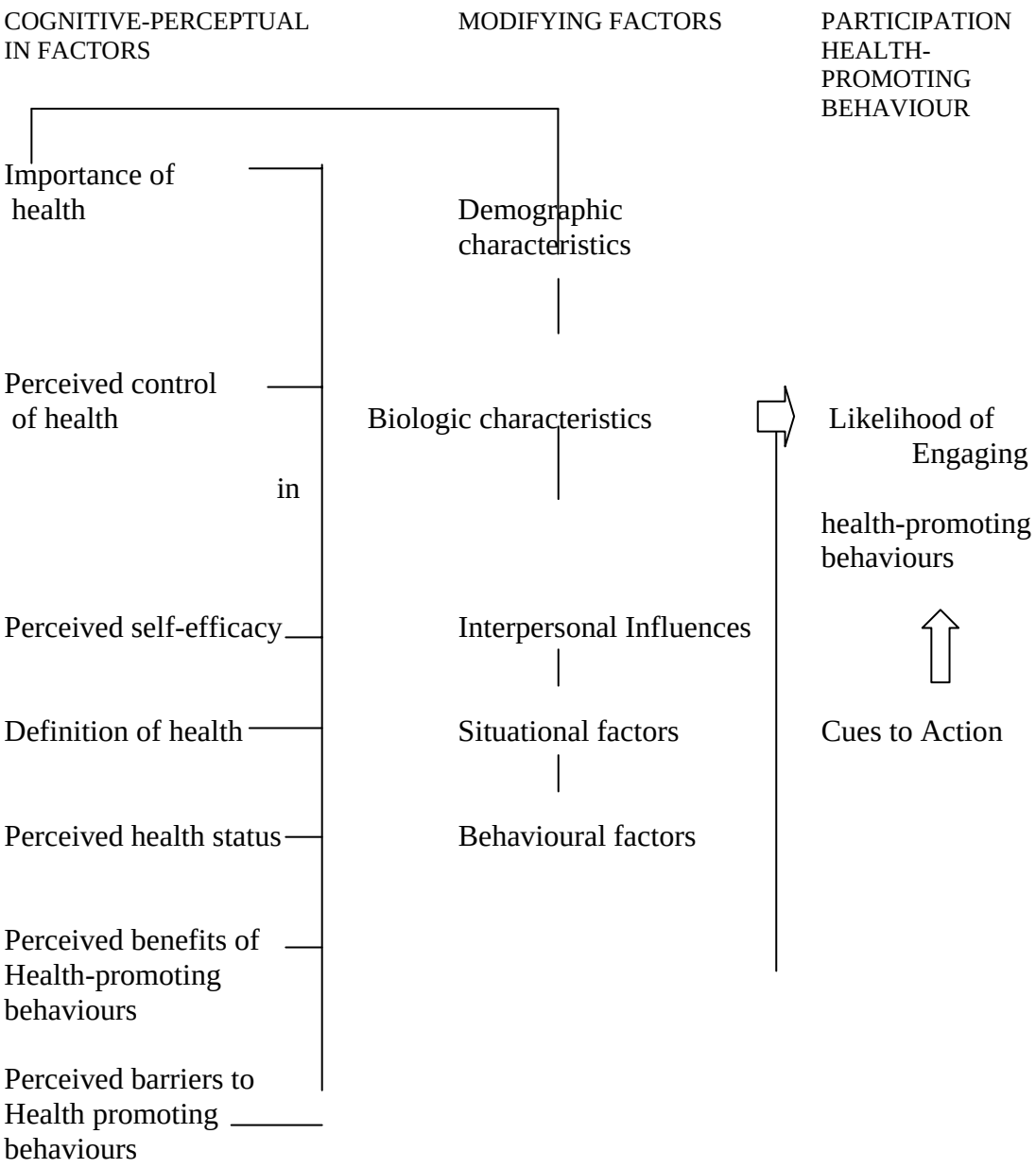
Proponents of the Health Promotion Model argue that environmental constraints may be inhibiting individuals who are motivated to change. For example, poor tuckshop options in schools may make it more difficult for a motivated child to engender change. Pender (1987) has also recognised the importance of prior

behaviour in making new change. The skills acquired from a previous action may contribute to more complex behaviours in the future.

Finally, the model described the element of using cues for action. This was defined as either internal (eg where the person may have increased feelings of wellbeing) or external cues (eg having conversations with others about the new behaviour) which may serve as triggers to engage in the health behaviour (Pender, 1987).

It became evident to the researcher that drinking water could potentially be seen as a 'healthy promoting behaviour', not unlike people engaging in exercise or applying sunscreen to promote health. By applying a health promotion model to explore certain healthy behaviours, it was determined that it would provide a foundation and focus for the study. In this study, the model served to guide the structure and content of the interview questions.

Figure 1: Pender's Health Promotion Model



Research Questions

1) Do parents' and teachers' attitudes and beliefs about water have an influence on a child's water consumption?

2) Are parents' and teachers' self-perception as role models influenced by their own water consumption behaviour?

The Research Design

This study has been designed as an exploratory qualitative descriptive study. This type of approach is seen to be the most suitable in terms of exploring participants' attitudes and beliefs and in addition, describing water consumption behaviours of themselves and that of their children, as well as allowing participants to describe the school environment which is an important setting for health behaviours.

Neuman (1997) describes exploratory research as the starting point when little is known about a phenomenon. Some of the goals of exploratory research are identified as 1) 'becoming familiar with the basic facts, people and concerns involved' 2) 'and develop a well-grounded mental picture of what is occurring'. Exploratory research may often deal with 'what' types of questions (Neuman, 1997).

Descriptive research is similar in that it begins with a subject or situation and aims to presents 'a picture of types of people or of social activities'. Several goals of descriptive research are 1)'provide an accurate picture of a group' 2) 'describe a process, mechanism, or relationship' and 3) 'find information to stimulate new explanation' (Neuman, 1997). This type of research is concerned with addressing 'how' and 'who' types of questions.

Advantages of descriptive and exploratory designs have been described as 1) a valued way to collect rich detailed data and 2) the description, comparison and classification of data contributes to a more holistic view of the problem (Seaman, 1987).

The Participants

A purposeful sample of 9 people participated in the study. This included 6 people who identified as being parents of children at the specified school, and 3 people identified as being teachers of the school. The principal of the school had identified potential parent participants involved in the school tuckshop as a group which may have had a particular interest in childhood nutrition. This study acknowledges that the views expressed by participants in this study may not be true for all parents and teachers. However, the usefulness of qualitative research is that it develops new knowledge by rich descriptions of people's daily contexts and their own subjective experiences and insights, which may be unique to them. In addition, qualitative data can provide descriptions of people's connections to the past (eg parents and teachers views on their own personal history of fluid consumption from childhood) and also views on the future (Roberts & Taylor, 2002).

In addition, teachers were targeted via flyers and teachers were approached at a staff meeting in an effort to recruit participants. Eight participants identified as being part of the one school, one teacher identified as being a 'supply teacher' but had worked in the school for a period of time.

The Setting

This study was conducted in one regional state primary school. There are currently approximately 600 students enrolled. Historically, students have came from a middle socio-economic background, with the majority of parents working in professional, trade or administration occupations. There are a growing number of students who are from a Non – English speaking background. There are a low percentage of students from an Indigenous background. Except for one participant

where the research was conducted in their own home, all other participants were interviewed in private rooms in the school, either in the common room or meeting room.

Ethical Considerations

Ethics clearance was obtained from both the University of Queensland and Education Queensland. A copy of USQ's Ethics Clearance appears in Appendix G. Education Queensland as part of their research process requires that ethics approval be obtained from a university ethics committee or health department ethics committee prior to conducting research in schools. In addition, a separate ethics application was submitted to Education Queensland using their template for consideration. In line with obtaining ethics clearance, participants were given an information sheet (Appendix B) about the study in plain English and were asked to sign a consent form (Appendix C). Interested participants returned consent forms to the Centre for Rural and Remote Area Health, University of Southern Queensland. Each participant was asked to complete the 24- hour Fluid Recall Form prior to attending an interview.

Discussions were held with the principal and office administration staff about the suitability and availability of an interview space. It was decided that a meeting room located privately near the tuckshop would be appropriate.

During the semi-structured interviews, participants were asked to select a name to use during the interview other than their own to ensure anonymity. The transcripts and results have been coded with participant numbers ie parent P1 – P6, teacher T1 – T3.

Data Collection

Interview Questions

In terms of structuring interview questions, it was decided to semi-structure the interviews to help guide questions to particular focus areas. This was to ensure that there was the potential for greater collection of in-depth information.

Semi-structured interview questions were developed based upon components of The Health Promotion Model (Pender, 1987). An example of the questions developed corresponding to the mode, are provided in Appendix D.

Questions were developed for both teachers and parents. Whilst most of the questions for all participants were the same, some had a slightly different focus, eg teachers' were questioned about their role modelling behaviour as a teacher in the school environment.

A criticism of previous school health programs is that, despite some attempt to apply psychological theories to predict or influence behaviour, they often failed to consider the broader influences that impact on or within the school environment (Australian Health Promoting Schools Association, 1997).

The use of the model in this study guided questions which not only focused on an individual's thoughts, but also examined external factors which may impact on health behaviours. Within a health promotion strategy, it is important to consider how we can influence behaviour and incorporate this into our programs so that they are more likely to be adopted and sustained (Egger et al., 1999). It provided a framework for examining attitudes and beliefs from teachers and parents from a broader perspective.

Conducting the Interviews

It was assumed that conducting this study in the school setting would be more convenient for staff and parents and therefore may be a positive contributing factor to aid participation rates. Seven interviews were held in a private interview room near the tuckshop, one was located in the staff lunchroom (not in peak time) and one was conducted in a participant's own home.

Participants were given an opportunity to nominate days and times that an interview would be suitable for them. Once the consent form was received, the participant was contacted to arrange a suitable interview time and venue. Each participant was sent a letter outlining their interview time and was also encouraged to bring along their 24-hour Fluid Recall Form.

On arrival, participants were given the list of proposed questions to peruse and were encouraged to ask any questions. Consent to participate in the study was again explained and participants were informed about the interview process including the use of a tape recorder. Verbal permission was obtained to audiotape the interviews. During some of the interviews young children were present and provisions were made to accommodate them ie arranging toys and drinks and discussing pausing the interview if necessary. The average duration of interviews was one hour.

In relation to interview questions, following feedback from participant 1, some questions were modified as it was felt that they were too repetitive. The revised list of questions is provided in Appendix E and F.

Part of qualitative research is to be able to fully understand the phenomena in question. A term called 'saturation' has been used to describe when enough data

have been collected for the themes to be fully understood and developed and when the researcher believes that no new themes will emerge or no new information can be obtained then the data (Fossey, Harvey, McDermott, & Davidson, 2002). In terms of the parent interviews, it was determined by the researcher that 'data saturation' occurred following the interview with (P3). For teachers on the other hand, despite much of the data indicating common themes, it is questionable as to whether the teacher interviews resulted in 'data saturation', due to the limited number of participants who were recruited. In the early phases of data analysis during this study, the researcher listened and read the participants' transcripts to get an idea of themes that were emerging (Lindsey & McGuinness, 1998).

Each audiotaped interview was transcribed verbatim. Following manual transcription of the interview from the audiotape, each participant was forwarded a copy of the transcript and invited to comment on its content. Only minor grammatical changes were made to the transcripts from participants' comments.

24-hour Fluid Recall Form

As an adjunct in examining teachers' and parents' water consumption behaviours, it was deemed beneficial to examine how much water they were currently drinking. The intent was to investigate what fluids were being consumed over a 24-hour period. Whilst this would not be useful if the intent was to examine habitual water consumption behaviours, it was however designed to provide some description of current behaviours. It is designed to seek further exploration of role modelling and also provide some greater context in relation to water consumption behaviours and settings.

In terms of understanding water consumption behaviours, it was deemed more reliable to ask the parents and teachers to self–report their intake and describe children's' consumption patterns rather than relying on a young child's account.

The technique of self-reporting intake has been widely used in nutrition studies (Australian Bureau of Statistics, 2003; Australian Institute of Health and Welfare, 2005; Cook, 2001). Whilst it could be argued that it could be difficult for parents to accurately state how much water they thought their child was drinking particularly when they are unable to observe whilst they are at school, the data from the 24-hr fluid recall form were designed to provide another perspective and not necessarily provide substantial quantitative data.

A benchmark for determining whether parents and teachers were consuming an adequate fluid intake were based upon the current recommendation of 8 standard glasses (250 ml/glass) of water for adults (Nutrition Australia, 2002). This 24 hour fluid recall form (Appendix A) was developed in consultation with staff from the Toowoomba Health Service District, including a Community Nutritionist and a Nurse from the Continence Service.

Data Analysis

This study used a qualitative method of 'single text analysis' (Roberts & Taylor, 2002). Firstly, each transcript was analysed for common concepts (each of these main concepts was allocated a number). Secondly, the analysis underwent a collective process whereby the researcher used a "pile on the kitchen table method" (Roberts & Taylor, 2002). This is simply when the researcher places the collective transcripts on a table and cuts out sections of text which appear to be connected (Roberts & Taylor, 2002). The analysis involved forming 'piles' where the most

frequent concepts were placed together. After reading and re-reading the concepts, these piles were reduced to a selection of essential themes. To counteract the potential loss of meaning of some data within overall themes, a number of sub-themes were also developed from the groups. The coding of the data into themes has resulted in a selection of key themes and sub-themes (Chapter 4 Results).

Criticisms have been made of qualitative studies, with some deeming them as 'unscientific', subject to researcher bias, and lacking generalisability and reproducibility (Mays & Pope, 1995). As a means of improving rigour, participants were able to comment on the transcripts' content which contributed to greater accuracy and reliability. The researcher's supervisors were also provided with copies of transcripts in an attempt to cross validate the themes selected.

This study also used 'complimentary evidence' (Neuman, 1997). Whilst not suggestive of data triangulation, where quantitative data are sometimes used to support qualitative data to support greater rigour, this study used the 24-hr Fluid Recall Form as a means of 'complimenting' data from the semi-structured interviews, by way of exploring the issue of water consumption from a broader perspective. In addition, In terms of the 24-hr Fluid Recall Form, the data have been presented as histograms to visually organise and presented the data. This can be seen in Chapter 4 Results.

CHAPTER 4: RESULTS

This chapter presents the findings of the study. A number of key themes and sub-themes were identified from the transcripts. Data from the semi-structured interviews are presented verbatim with no changes to the content from the transcriptions. Results from the completion of the 24-hr Fluid Recall Forms have been presented as histograms and tables for description and comparison between teachers and parents responses.

Key Themes and Sub- Themes

Key themes were identified from the participants' transcripts. The key themes and sub-themes are presented in Table 1.

In terms of distinguishing data between parents and teachers, the coding of P1-P6 for parent participants and T1-T3 teacher participants has been used.

Table 1: Key Themes and Sub-themes from qualitative data

Key Themes	Sub-Themes
1. Perception of health (Individual and Children)	
2. Benefits of water	a) Importance of water b) Identified signs of dehydration c) Role of physical activity and water consumption
3. Knowledge of recommended water intake	a) Climatic influences
4. Preferences for fluids	a) Water preferences b) Water quality c) Bottled water
5. Parents' role in children's water consumption	a) Access to water in the home / school b) Verbal prompting c) Purchase of fluids d) Parental history of fluid consumption
6. Broader societal influences on fluid consumption	a) Marketing b) Advertising c) Peer Pressure d) Tuckshops
7. Teachers role in water consumption	a) Access to water b) Prompting c) Education
8. School Water Drinking Facilities	a) General maintenance b) Hygiene c) Location d) Taste preferences
9. Self – determination	a) Self-talk / messages b) Visual Cues

Key Theme 1: Perception of Health (Individual and Children)

Perceptions of Individual Health Status

Participants were asked during the interview for their perception of their current state of health. Of the participants, two stated that they were very healthy (P1 & P5).

"I'm very healthy. I don't have any illnesses. I'm not on any real medication other than the pill, so, and yeah I think I'm fairly healthy. I'm reasonably fit, yep". P1

Comments from other participants included descriptions such as their health being fair (P2), reasonable (P3) not good but getting better (T3), and well (P6). No comments were recorded for T2. (P4) indicated that they "could be better",

"It could be a hell of a lot better, yeah, I just probably don't just get enough exercise you know, food wise, um I'm probably choosing healthy options, obviously I'm not drinking enough water. My nails are in a dreadful state, I've got cellulite, my hair's not the best, I'm overweight. I'm old, I'm cranky". P4

And (T1) stating that:

"I've always been conscious of being fit and healthy. I don't smoke; I probably drink more wine than what I ever have in my life. I'm probably carrying 4kgs at the moment too much, I get too uncomfortable. I walk 3 times a week". T1

Perceptions of Children's Health Status

Parents were asked to comment on their own children's state of health. All parents considered their children to be healthy. Comments included that their children's' health was very good (P1), quite good (P3), pretty good (P4), disgustingly healthy (P5) and well (P6). Two of the parents described their children as being healthy due to absences of illnesses or colds.

"We're all a pretty healthy family, we don't, none of my children have any illnesses or they don't suffer from asthma or anything like that, diabetes or anything so they are all healthy". P1

"Actually they're well. You know we came through winter I had one cold, and my kids I think had colds and never had a day off school so you know they're well". P6

"Yeah, they're pretty good. Certainly exercise wise they get heaps and heaps of exercise. Oldest daughter is more inclined to healthier choices than the younger one". P4

Teachers were also asked to comment on how they perceived the children's health in their classes. A response was recorded for T3 due to the question being directly asked. No comments were recorded for T1 & T2.

"I think it's probably OK. I can only think of probably two children who are above the healthy weight or what I just judge as a healthy weight. Overall, I think that they're fairly healthy, they seem pretty active at lunchtime". T3

Key Theme 2: Benefits of Water

During the interviews, participants were asked to describe what they considered to be benefits of drinking water. The major categories of benefits have been highlighted in Table 2 with examples of participant comments. Participants reported a broad range of benefits from complexion changes, greater energy and vitality and cognitive improvements. Most commonly participants cited improvements in their complexion, water flushing out impurities from the body, cognitive changes such as (better attention and concentration span and greater alertness) and prevention or reduction in headaches as benefits for drinking water.

Table 2: Benefits of drinking water

Benefit of Drinking Water	Participant Comment	Participant Number
Complexion	• Makes your skin look better • Fingernails • Healthy Hair	P1, T1, T3 P4 P4
Flushing impurities from the body	• Flushing out the body • Flushing out kidneys • Flushing impurities out	P1, P6, T2, T1.
Helps with bowels (aids in digestion and helping to prevent constipation)	• Good for digestion	P1, P6
Weight Control		P3, T2
Good for general health and wellbeing	• "Helps you to be healthy on the inside"	P4
Energy Levels		P1, P2
Cognitive Functioning:	• Better attention span, more alert and better concentration	P1, P2, T1, T3
Effects on immune system	• Builds up immune system • "gets bugs out of your system" • "good when children are not feeling well	T2 P3, P4
Impact on Headaches	• Helps to prevent headaches	P2, T1, T2
Alcohol consumption Digestion of fluids	• Helps to dilute the effects of alcohol • Easy for body to digest	P5 P6
Influences on the brain and circulatory system	• Good for the brain and circulation	T1
Effects on Children's Behaviour	• Act of getting up and getting a drink has a calming effect.	T3
Emotional wellbeing	• Gives you a sense of feeling happier and more contented	T3

Additional comments included the benefits of water compared with sugary drinks, and that there was a 'sense of knowing' that water was a healthier choice.

"Like your other drinks for example, like they just have too much sugars, and that's why I prefer them to drink water". "Just health wise we just know that water is better for them" (children). P2

One participant, who is a teacher, commented positively about water for children in the class.

"Generally they'll run around like mad in the breaks and they will be more, they will pay more attention and have less headaches and a lot less of aches and pains. Just generally better health if they drink more water". P2

2a) Importance of Water

Participants were asked whether they considered drinking water as an important part of their health. They were also questioned about how they rated water compared with other drinks that they may consume ie milk, juice, sweet drinks (soft drinks). Participants stated that the importance of water in their diet ranged between being 'fairly important' to 'very important'. P1 rated water very highly in terms of dental health. Even though water is not fluoridated in the local area, the parent felt that water was better than other fluid choices by reducing their child's overall sugar intake. P3 responded in terms of weight loss by stating

"…with myself if I try and lose weight, if I cut out any other fluids, if I just drink water, I tend to lose weight a lot easier". P3

Water consumption was also discussed in terms of needing balance in a child's diet. Fluids such as juice for breakfast and milk with dinner were important for P3. P2 thought that the consumption of water was more important that making healthy food choices. Teachers felt that it was important for children to drink water because 1) it reduced amount of headaches and 2) had a positive effect on their energy levels.

"I think that it's really important because your body's mainly made up of water and a lot of health problems that people experience often contributes to not enough water like headaches. I think sometimes being lethargic um dehydration and not feeling well so I think it's a really important side of health. It lubricates the brain and the body, giving the best possible outcome for the brain to work effectively". T3

Water was also discussed in terms of its role in aiding digestion and 'flushing out the body'. P1 stated that:

"I notice that my son who drinks a lot of water doesn't have a problem with digestion, and my daughter has a lot of problems with digestion and she's always getting heartburn and you know things like that, and she has to have antacids sometimes and I think she's not getting that water to flush her system properly with the food". P1

2b) Identified signs of dehydration

In terms of dehydration, parents and teachers all reported a number of physical symptoms, that they considered to be indicative of a person (themselves or

their children/students) suffering from dehydration. These are outlined in the Table 3 below. Key words from participants' comments have been included and subsequently categorised. Approximately half of the participants cited thirst and a decrease in energy levels (including words such as lethargy, listlessness, tired and limp) as main signs of someone being dehydrated. T3 stated that children should only drink when they are thirsty and that drinking water when you're not thirsty is "the worst time to drink". Headaches were a common sign of dehydration by adults and children.

Having some complexion changes (including redness in the face, flushed look, dry lips, poor skin tone, black circles under eyes) were also identified signs by some of the participants.

P4 commented on her daughter stating that she has problems at night due to a "burning sensation" related to a lack of water consumption.

"My youngest daughter on occasions wakes up in the middle of the night with um, burning sensation because she obviously hasn't had enough water, during the day, and then we have to get out all the medications to try and get her back to sleep and give her water and things and talk to her about the importance of drinking water and making sure she drinks it" P4

Table 3: Signs of Dehydration reported by participants

	Key Words	Categories
P1	Lips dry and wrinkly, black under the eyes, complexion, listlessness	Complexion Energy Levels
P2	Children tired and limp, headaches, dry lips, lethargy	Complexion Energy Levels Headaches
P3	Migraines, thirst	Headaches / Migraine Thirst
P4	Dry throat, daughter urinary – burning sensation. Cellulite, thirst, lethargy, poor skin tone	Dry throat Urinary discomfort Cellulite Thirst Energy Levels Complexion
P5	Drinks when feeling thirsty, dry mouth, less frequency to the toilet. Sweaty and tired	Thirst Dry mouth Energy Levels Increased sweat production Decreased urine production
P6	Bad breath, dry mouth, headaches	Bad breath Dry Mouth Headaches
T1	Thirst, sweating, face bright red, headaches	Thirst Increased sweat production Headaches Facial colour
T2	Headaches, pain between shoulder blades, redness in the face, lethargy	Headaches Shoulder pain Facial colour Energy Levels
T3	Headaches, lethargy, not feeling well, feeling thirsty, dry lips, flushed appearance, nausea	Headaches Energy Levels Thirst Dry Lips Nausea General health feeling

2c) Role of Physical Activity and water consumption

Most participants related an increase in water consumption to how much physical activity their child / student did. This means that the more sport or physically active a child is, then the more he/she would need to drink. Participants thought that it was important for children to drink adequate amounts of water before and after playing sport or engaging in physical activity. They also thought that it was necessary for children to take a water bottle with them for sport. Exercise was seen as having a positive influence on the child's health. (P4) A connection was made between exercise and differences between siblings making healthy choices.

Key Theme 3: Knowledge of Recommended Water Intake

Participants were asked to discuss how much water they thought adults and children should drink on a daily basis. Clearly both parents and teachers were unsure as to how much they should be drinking, how much their children should drink dependant on their age, and whether children should drink the same amount as adults. Participants either responded with amounts in glasses or litres. One glass was determined to be equal to 250ml.

Five participants thought that adults needed to consume between 6 to 8 glasses of water a day. Two of these stated that adults should consume 8 glasses, two stated 6 to 8 glasses, and one stated 6 glasses per day.

P6 stated that adults should consume between 1 to 2 litres of water a day (4 to 8 glasses per day) and more if exercising. Surprisingly, P5 recommended that adults consume 3 litres of water per day. P4 stated that adults should consume 8 to 10 glasses of water per day and that if a person consumes a lot of coffee (which contains

caffeine) then this would have a diuretic effect and therefore a person would need to consume even more water to counteract this.

In terms of what participants thought would be ideal amounts for children to consume, responses were varied. A number of participants responded by not providing a different amount for children, but rather stating that both adults and children should drink the same amount (P3, P4, & P5). P5 stated that children as well as adults should drink 3 litres of water a day. Whilst less than that, P4 believed that a child should be drinking 8 to 10 glasses of water a day, equivalent to that of an adult.

Most participants however stated that an amount between 1 to 1.5 litres might be an ideal amount for their children to drink. Although even within this group, a small number of parents indicated that there were no differences in the recommended amount between a much younger child and an older child. Some parents stated that even with these recommendations, they considered their own children to be drinking less than what they considered to be recommended daily amounts. One of the reasons given was that on weekends children are more distracted by other things. Parents appeared uncertain as to the accuracy of how much water their child consumes because a) they are busy and don't always notice what they have, b) unsure how much they may consume at school via school bubbler and c) they are aware that they may have water at home via taps/jugs and other fluids when they are at home.

T1 stated that children should drink the same of amount of water regardless of climate, meaning that they should have the same amount in summer and winter. This same participant stated that she consumes less water than she would like due to irritable bowel syndrome. Any increase in water consumption creates painful attacks

and she is cautious about this effect at work and therefore makes active choices to limit her consumption.

P3 states that she ensures that her children have at least 1 litre of water before commencing sport and also stated that she didn't think "children could ever drink enough water".

3a) Climatic Influences

The majority of participants stated that in hotter weather (ie summer) they consumed larger amount of water. Several participants discussed how important the use of water bottles in the classroom was for children as a strategy for maintaining hydration. A number of parents stated that children should be allowed to do this on very hot or extremely hot days. A small number of parents were unsure as to whether their child was using a water bottle in the classroom during the winter months. P6 believed that water bottles in the classroom shouldn't be encouraged as much in winter;

"I'd just think of the dehydration in summer, cause they run in summer as much as they do in winter". P6

The weather's temperature also had an influence on the types of fluids consumed with water being more frequently consumed in summer, whilst other drinks such as milo, tea/coffee, and cup of soup being consumed in winter. The temperature at which water was consumed was a factor in all seasons. Freezing or cooling water was done in the hotter months of the year. This is supported by comments such as:

"***I've gone from drinking 2 litres of water a day (when living in North Qld) to hardly any in winter. So, and I feel that, health wise obviously. I don't feel as good, you know, internally as good. When it's cold you just don't want to drink". P1***

Between seasons, P5 stated that you go through a period of adjustment of drinking water.

"I think probably coming out from the change of season you know um, they need to get back into the swing of drinking water, I'm sure that would help. It just takes them a while to get back into that routine again after winter". P5

In addition, there may be a change in focus in the parents' approach for encouraging water between seasons.

"Every now and again, coming into summer, I probably um am more aware and probably encourage them, reminding them to take their bottles to school each day and making sure that they um have something to drink when they get home". P5

Key Theme 4: Preferences for fluids

Most participants cited drinking town water. A few participants stated that they either boiled or filtered their water and one participant stated that she consumed tank water. A small number of participants preferred cooled water from the fridge, whilst others preferred the taste of water at room temperature. One participant stated that water at room temperature was 'boring'.

In terms of children's preferences for fluids, most children liked cool water (especially in summer) whilst others were not opposed to drinking water at room temperature. Some parents stated that a sense of balance was important in considering their children's fluid intake. Most parents were advocates of children consuming a range of fluids including milk, and juice and limits of soft drink. P3 stated that "all fluids have benefits".

Some participants discussed that their children had a routine of drinking fluids at different meal times during the day. Some children consumed juice at breakfast, milk or juice with dinner. P2 stated that drinks other than water contained too much sugar and that sugary drinks were not effective in quenching thirst. P1's daughter consumes a large quantity of juice (even watered down) but the parent stated that she suffers from tooth decay.

Some parents appeared less restrictive on their children drinking soft drink. Whilst still considering them to be a 'treat', they were not opposed to the children drinking soft drink at night and on the weekends, if their child was usually very physically active. On the other hand, some parents were active in limiting the amount of soft drinks consumed. P5 stated that "***if you cut out everything that's bad for you it doesn't leave much".***

Some participants stated that taste was a big factor in what children preferred to drink. Some parents perceived that water could be boring and some children preferred sweet drinks such as sport drinks, soft drink and cordial as being more enticing.

A small number of participants stated that there were differences between sibling's preferences ie one child would often consume more water than the other

child would. Differences between siblings were predominantly not considered a problem, they were perceived as 'just different'.

4b) Water Quality

Participants had made a number of general comments about the quality of town water. Approximately half of the participants cited the current town water as having a poor taste (with the word disgusting used to describe the taste). Several other participants stated that they boiled water for taste and also for health reasons (improving safety of the water). Some participants stated that they drink tank water stating that it tasted nicer than town water and two participants stated that the local water should contain fluoride to improve dental health. P4 stated that they often add cordial to town water so that there may be advantages for water that's not pure:

"If you subject yourself to too much pure stuff then your bodies will not be able to cope with it, you know it's like antibiotics". P4

4c) Bottled Water

Most participants stated that they purchased bottled water. Some of the reasons were convenience and taste (compared with town water). In addition, some participants stated that there was a 'sense of security' in purchasing bottled water because it was 'sealed with a lid'.

Most participants found it easy to buy bottled water in grocery shops, service stations and gyms. One participant thought that buying non-brand bottled water was relatively inexpensive compared with 'designer brand' bottled water.

Visually seeing bottled water displayed in shops was one prompt for a participant to drink water. P4 stated that her husband was opposed to buying bottled water, stating that town water was certainly adequate. On the other hand, she did not mind purchasing bottled water if access to tap water was difficult or if she did not bring her own water bottle from home.

One participant thought that bottled water was a 'fashion accessory':

"It's become a fashion item, hasn't it the bottled water? It's become huge. You never see anybody out without a bottle of water, especially the younger generation. My nephews are in their early twenties and they never go anywhere without their bottled water". P4

Key Theme 5: Parent's role in children's water consumption

5a) Access to water in the home / school

Most parents discussed strategies that they had implemented to encourage their children to drink water at home. These strategies included filling up jugs / coolers of water to be left on benches or be chilled in the fridge, ensuring that their child has a water bottle for school, or having individual water bottles in the fridge. P4 stated that her children were relatively 'self-sufficient' and often got their own water from the kitchen tap. Participant 2 stated that she looks for ways to add interest to water by adding slices of lemon and ice cubes.

5b) Verbal prompting

All parents interviewed considered themselves as being 'role models' for their children in relation to encouraging them to drink water. Of these participants two stated that the role of the father in modelling good water drinking behaviour and contributing to health messages was seen to be a positive influence on the children. Whilst some parents were conscious of their own water drinking behaviours in front of their children, some parents felt that their children would not take notice of what they were drinking.

The roles that parents described in terms of encouraging their children to drink water were varied. For some parents it was important to encourage children to drink water with their meals. For most it was about educating them about the general importance of water for general health and wellbeing. Commonly parents encouraged their children to drink more water before and after playing sport. Largely this was by reminding them to take their water bottle with them. One parent educated her child about the concentration of urine and how to identify colour as a means of determining adequate hydration. Two participants regularly ask their children how much water they have drunk in a day, and others actively discourage or limit sweet drinks in favour of drinking water. A small number of parents described part of their role as identifying physical symptoms of poor hydration ie bad breath, constipation, and "burning sensation" on urination and then encouraging their child to drink more.

One participant described encouraging her child to drink more water but in a punitive way. She states that she tells her daughter to drink more water otherwise she will 'end up in hospital'. One participant talked about playing a game that involved the child attempting to drink water supplied in a jug;

"I do a game for the kids. I fill a litre (1L) jug and that's their water on the weekend. They need to get through at least a litre of water. I say to them if their urine is yellow, you're not drinking enough water". P2

5c) Purchase of fluids

Some parents discussed the purchase of buying other types of fluids including juices, soft drinks and cordial. Two participants stated that their children have regular access to cordial. Some children consumed juice on a daily basis, particularly with meal times ie breakfast and dinner. Mostly soft drinks were considered to be a treat. The most likely times when children would drink soft drink is when takeaway was purchased, or when out socialising with family or at a birthday party. Some parents felt that they made active decisions to limit the amount of soft drink available in the home and that if it was more available the 'children would probably drink it'.

A small number of parents felt that it is important for children to have 'variety' in their diet. This meant that sweet drinks were considered to be part of the diet.

"They sometimes have a drink of soft drink in an afternoon, that's actually if we've got it, because it's quite of a novelty. It could be a daily thing. The cans can sit in the fridge and nobody touches it and then another day all of the cans are gone. It just depends on what they feel like doing". P6

"I think it's good to have the variety you know because you can't drink the one thing all the time. In having the milk and they even make themselves an iced

coffee so they will drink the plain milk, and they do have a glass of juice and soft drink and cordial. They're not flooding it with one or the other, you know it's just a nice bit of everything". P6

"As they've become older and they've become more active you probably don't worry that they do have a bit of soft drink". P6

5d) Parental history of fluid consumption

Parents were asked to recall their own drinking habits as a young child. Some parents remembered having a tank and that was their source of drinking water. Milk was a common drink for participants. P1 recalled living in North Queensland where she drank a large quantity of water due to the hot and humid climate. She remembered drinking lots of cordial in an attempt to deal with drinking lots of 'boring water'. Some participants commented on the fact that consuming juices and soft drink was very limited or not allowed by their parents.

Three of the participants had negative memories of school water facilities thinking that they were dirty and that they avoided drinking from them. T1 stated that she took frozen cordial to school and never took plain water and that water was not encouraged to be drunk in the classroom. P2 stated that she grew up not being encouraged to drink plain water at all. A number of participants talked about the possible link between how they were influenced as children and what their children consume now. P1 stated that she thinks that her children 'are probably cordial drinkers' because she was. P5 stated in terms of overall diet,

"If you cut out everything that's bad for you, it doesn't leave much". P5

P6 despite recalling a variety of fluids that she consumed when young, for example, flavoured milk, cordial, limited juice and when older experimenting with cups of tea, she stated that (in relation to her children), that;

"They've probably got more variety because I didn't". P6

The idea of variety in their child's diet was discussed by a number of participants. The following statements provide examples;

"You know if you crammed one thing down their neck eventually they would actually drink nothing. So you know if you've got a variety then at least they've got a choice". P6

"My children would have much more soft drink than what we were ever allowed to". P5

Key Theme 6: Broader societal influences on fluid consumption

6a) Marketing

In relation to the marketing of water and promoting benefits of its consumption, a number of parents believed that water itself was not marketed well, particularly in the local area. Although there are more brands of bottled water on the market now (P6), it may not be necessarily advertised well in the media. T8 stated that the issues surrounding recycling of water and issues related to the drought have maybe meant that people are tuned in to conserving it, not necessarily thinking about drinking more of it. If water is to be encouraged more for children, T2 & T3 both

stated that any sort of marketing to encourage children to drink water, would probably be more effective in much younger children with the use of a 'cute cartoon character'.

Broader marketing involving other health professionals could include medical staff. According to P1 and T3 felt that doctors could play an important part in promoting and encouraging people to drink more water during their regular check-ups.

6b) Advertising

Most participants stated that water was not generally well advertised, despite advertising being considered by them as one of the significant influences on a child's nutrition.

T3 stated that she had observed younger children being less inclined to be influenced by television advertisements, rather they seemed to be more influenced by computer games.

Advertising appears to 'lure' people in trying new products simply because they are 'new' or a great idea. P6 stated that sport drinks advertising had enticed her son into drinking it, to get 'more energy'. P5 that water was not promoted well with takeaway food, but rather soft drink choices appeared often to be part of purchasing higher fat food.

6c) Peer Pressure

Parents and teachers were both questioned about their perception of the role of peers in terms of influencing the child's nutritional behaviour. Peer pressure

continues to be a significant influence on children, in terms of acceptability of drinking water or choosing other types of fluids.

"I think it's with their mates, their mates are going to the bubblers for a drink of water, I'd just like to think that they would follow them as well". P6

"She (daughter) wants to take a water bottle because everyone in the class has a water bottle and she will drink the whole bottle, you know in a day, whereas before she probably wouldn't have had it at all. So that's had a big impact". P1

One teacher was describing the practice of children bringing water bottles into the classroom, whereby she doesn't actively promote it but rather she is not discouraging of children bringing in bottles if they choose to do that.

"They would see a social comparison. They would see other water bottles and they would just know that it's OK to bring a water bottle to school". T1

One parent (P6) stated that although it is common practice for children at school to bring their own water bottles along or drink from the bubblers, she didn't perceive that water at school would ever be seen as a "cool thing" by the children.

In terms of choosing other types of fluids, peer pressure influences children by if a larger group of friends is trying something new for example, 'play water' at the tuckshop, then they all want to try it. T1 had noticed that there is a certain 'novelty factor' in trying something new and that this is what often encouraged children to change their habits.

6d) Tuckshops

The school has a tuckshop that operates each day of the school week. In relation to what children purchase, the new flavoured 'play water' has been perceived as a very popular choice for children. For plain water sold at the tuckshop, P3 and P6 stated that they sold very little to children. But P5 had been surprised when she had worked in the tuckshop as to amount of bottled water was sold over other types of fluids in summer.

A number of parents, who had worked in the tuckshop, felt that as volunteers they didn't have a particularly influential role in children's nutrition, P1 and P5. P5 stated that tuckshops were in a difficult position in attempting to make healthier changes. This is because she thought that parents were the ones who should be responsible for educating their children and encouraging them to make healthier choices, rather than putting increasing pressure on tuckshops.

For what is available in the tuckshop for children to drink, a number of parents felt that it was important for tuckshop to have a range of fluids for children to drink, and that 'variety' was seen to be important, P5 and P6. T1 and T3 both stated that all they think children need to drink at school should be water and milk. P6 stated that although she saw a role in tuckshop promoting water as a good choice of fluid to drink, she also stated that children should have a broad range of other drinks to choose from.

Key Theme 7: Teachers' role in water consumption

7a) Access to water

Most parents discussed positively the strategy by teachers of allowing children to bring their own water bottles into the classroom as a way of encouraging

them to drink more water. Whilst some parents were unclear as to whether this strategy was only in summer, they were nevertheless supportive. One participant stated that by having drinks in the desks may make children 'less frightened' to ask for a drink. Another participant stated that she thought that having poor hydration may impact on their school performance;

"Absolutely. Any teacher would tell you that the worst time to teach a child is between 2 o'clock and 3 o'clock in the afternoon, because they've had their lunch break, they've been running around crazy, so they've exerted all this energy and you know they've perspired the whole bit, and they haven't had any fluid intake, they come back in and their tired and you can't get through to them". P4

Some parents discussed the importance of teachers allowing students to go and access water from the school bubblers.

"We have one teacher that my child has, and she realises there were certain interruptions during class, so what she would do and soon as the kids came up after play time – "Go get a drink of water and go to the toilet" – and you know they did that every morning when they got into class first thing in the morning". P4

In terms of what teachers thought about children bringing water into the classroom, they too made positive remarks. This is despite T2 who does not allow water in the music classroom to minimise potential damage to equipment. However, this teacher did state that she allows students to access a drink from the bubblers if requested. Some teachers made comment that there may be some behavioural

component to getting a drink in that some students may request to have a drink to 'get out of class'. Nevertheless, the teachers felt that they would not deny a child a drink unless their request was too frequent or their behaviour was poor. However T2 stated that she at times rewarded children with 'good behaviour' so get access to the bubblers before those children who exhibited 'poor behaviour'.

T2 stated that the problem she saw in allowing children to have access to more water is that they be more inclined to frequent the toilet, which in turn may be a distraction for the class. Two of the teachers stated that allowing water bottles in the classroom appears to be a shift in teaching practice which has occurred over the last ten years or so. The reasons cited were the recognition of climatic factors, a return to more simple style of teaching and greater emphasis on childhood nutrition.

T3 was quite active in promoting water consumption in the classroom. This teacher brought along extra water bottles in case children had forgotten theirs, she regularly drinks water in front of the children in the classroom, and she established rules about drinking in the classroom at the beginning of the year and informs parents at parent information nights.

7b) Prompting

Almost all of the parents stated that they felt that teachers had an important role in prompting and reminding students to drink water whilst at school. They also thought that it was positive that some teachers actively drank water in front of the children in the classroom either via a water bottle or jug. Both parents and teachers felt that this might send an implicit message that drinking water is a positive behaviour.

In addition, parents discussed the importance of teachers in reminding children to drink more water before and after sport or Physical Education classes, on hot days, and when moving between classes or activities around the school. P6 however felt that it was not the teacher's responsibility to encourage children to bring their water bottles to school, and that this should be a parental responsibility. This comment was mirrored by T2. P6 stated that she only expected teachers to remind children to drink on hot days and that teachers have 'enough on their plates'.

Two of the teachers stated that they only allowed children to bring plain water into the classroom and those additives ie Cordial was not allowed.

T2 was regularly involved in prompting students to drink water in the context of improving their singing voice. This participant also thought that teachers would have a greater role in junior grades in encouraging children to drink water – the younger children may be more susceptible to forgetting to drink water.

7c) Education

Some parents felt that teachers would have a more influential role in educating their children about the importance of water more so than themselves. That is, children may be more inclined to listen to what their teachers have to say. One parent felt that this may be more so the case in younger grades, where children particularly listened to what their teachers said. In addition, some parents commented on the fact that they believed that due to their work commitments they had very little time to spend with their child during the week.

Both parents and teachers stated that educating children about water in terms of their overall health and wellbeing was best addressed within the subject of Physical Education and that the PE teacher was seen as a vital role model in

promoting healthy fluids. Many teachers and parents felt that the PE teacher was also important for children to relate to in terms of healthy behaviour. Some stated it would not be appropriate for a PE teacher to drink fluids other than water at school (particularly with reference to soft drink consumption).

It appeared teachers were unsure as to where educating children about water consumption would fit within the current curriculum. Some discussed areas such as the Healthy Diet Pyramid however none of the teachers were able to discuss the specifics of what that entailed, stating it was 'something done in PE'.

"I'm sure that they've got to have something in HPE Syllabus, something touching on water. I know you've got your healthy food pyramid, there must be something in there about fluids but I haven't found it". T1

T1 stated that she felt that her overall role was not to be addressing health issues;

"Obviously it's not something that schools are responsible for I suppose. We are here for academic results and social skills more and more. Children aren't being taught how to play and how to play with other people. When it comes down to food I mean the governments taking over that, making tuckshops supply healthy food. I guess that next step is to make them supply healthy drinks. But they are only concentrating on healthy food aren't they". T1

T1 also stated that in terms on their undergraduate training, it was limited in terms of learning about nutrition.

"When we learnt about it at UNI (University) it was about sex education, self-esteem. No there's not much emphasis on water". T1

Furthermore, some teachers discussed the issue of water in terms of educating children about the importance of being 'water wise'. Although a local government water initiative, it bears no resemblance to educating students about importance of water for health and wellbeing. With reference to what strategies could implement to encourage children to drink more water, one teacher suggested having a competition to see how much water they (the children) could drink in a day. Another teacher suggested rewarding students with good water drinking behaviour with a jellybean or a sticker.

"Teachers have to educate about good nutrition and need to complement good messages from parents – children will otherwise place less value of its importance". T2

Key Theme 8: School Water Drinking Facilities

8a) General maintenance

General maintenance of the school water drinking facilities was perceived by participants in the context of usability. The majority of participants stated that the bubblers were often not functioning well due to obstructions such as sticks and sand. In addition, the bubblers were often a play tool for children where they would squirt each other particularly in warmer weather. P1 stated that from her observation, children were not using the bubblers because on some occasions that handles had 'busted off'. P4 and T2 state that either the water itself didn't flow well from the

bubblers or almost half of the bubblers did not work effectively. P2 and P3 stated that their children had expressed a dislike in the bubblers due to the warm temperature which was unappealing to drink. P6's children refuse to drink the school water preferring to bring their own water bottle to school.

8b) Hygiene

In terms of perceived hygiene of the school water bubblers, most participants held negative views about the water facilities. The majority of comments related to the uncertainty that young children would be touching the metal parts of the tap with their mouth, therefore being a source of cross –contamination. Due to this issue, P2 and P4 both discourage their children to top up their water bottles, which they brought from home from the bubblers. Participants P1, P6 and T3 did not discuss hygiene as an issue.

"I always think of the germs, I hate the idea of germs, it's like when you're at a park you know and you think how many other hands have touched that, and how many dogs tongues have come up and licked that. Oh, it's just horrible". T1

"It's a bit like Seinfeld for me, there are taps that lead to certain pipes you know. I've been forced to drink from the toilets tap, because when I had tablets, I'm just careful in not touching the taps, and letting the water come to me". T1

T2 made an observation of children in the school noticing that the younger children were more inclined to drink from the bubblers than older children.

8c) Location

Two participants stated that it would be good to have more water bubblers that were located more closely to the sporting ovals, and that when children went to PE or played sport they were having to be responsible for taking their own water bottles. T2 stated that more bubblers outside of the classroom would be advantageous in terms of 'keeping a closer eye on children' as they went for a drink. P5 was the only participant who thought that there was an adequate amount of bubblers throughout the school. A small number of participants also discussed that a system like a 'water cooler' in the classroom would be a good alternative in terms of hygiene, and ensuring that children have easier access to water throughout the day. Although this was a suggestion put forward, they were also concerned about the costly prohibitive nature of this.

8d) Taste Preferences (School Water)

Poor taste from the school bubblers was highlighted by a number of participants. A number of parents stated that their children refuse to drink out of the bubblers due to the taste or poor temperature.

"Well from talking with a lot of the students around the place, it just tastes bad. And so they don't want to drink it because it tastes bad. So I think that they probably could filter it, they could refrigerate it, and they'd probably drink a lot more of it. My son who loves water, won't drink that water at school. He (son) says it tastes like dirt, you know ordinarily. So I think taste is a big thing for kids, if it tastes good they'll drink it, and if it doesn't they won't". P1

"The kids don't like drinking out of them, they're just not comfortable drinking out of them, and it's hot water generally, and when hot and running around playing sport, that's why I opt to do the things I do (freezing water bottles)". P2

"My son doesn't use the bubblers, he reckons they're hot, and just a bit yucky". P3

Interestingly, T3 working in the school, when asked if she personally would drink from the bubblers she stated that "***no, not unless I'm desperate".***

A number of participants suggested that cooler water filters would be highly beneficial in the classrooms P3, P4, P5 and T2 The reasons put forward were that children may be more tempted to drink cooler water, it's would be more accessible and addresses previously mentioned hygiene issues.

"Yeah, it would be really wonderful, and I know this wouldn't happen, but if they had a big cooler of water in the classroom, the kids could go and get some water out of it". P4

"She would certainly drink more water if it was presented, you know, filtered and chilled would be the ultimate". P5

Key Theme 9: Self-Determination

9a) Self-talk

Parents and teachers were asked questions related to their own water drinking behaviour. A number of participants stated that drinking water was something that required conscious decisions 'having to force themselves' and reminding. For many

of them remembering to drink water a habit needed to be formed, which for some had taken some time.

"I find that down here not being so hot, (the climate), that I have to just get on top of myself every so often, like I'm going to drink. Like I will just fill up a jug on the counter at home and say – by the end of the day I will have drunk that jug of water. It more of a conscious decision that I'm going to do this thing". P1

"I know that I have to drink plenty of water, personally because I'm expecting at the moment. I try and make myself and force myself to do it to be an example for the kids" P2.

The following quotes relate to the issue of remembering to drink water.

"My biggest problem is that I forget to drink. I don't seem to recognise that I'm thirsty. Whereas I'll recognise that I'm hungry or will eat out of – oh well it must be lunchtime so I better eat". P4

"When I started to drink more water I was terrible, I would get to the end of the day and I'd have a bit of water drunk. I've really had to train myself to do it but now I'm in the pattern, but it took a while to actually think, I really should have a drink of water instead o having a diet coke or a coffee or a tea or something". T3

9b) Visual Cues

A number of participants talked about the fact that using particular visual cues such as water jugs in the fridge on benches or carrying a water bottle were useful to remind them to drink water. Not only is the cue useful in terms of remembering to drink but jugs and bottles were also used as measuring devices to monitor how much was being drunk each day.

"When I was working full time, I realised that I wasn't drinking enough water, I was making a conscious effort to have a water bottle on my desk thinking that, you know that would remind me to drink, but after a couple of days, it would just fade into the background of everything else that was on the desk". P4.

"What I try and do myself is fill a litre jug and refill it, and try and get through 2 litres. That's in summer, and obviously it does cut back in winter". P2.

T1 drinks from a water bottle regularly throughout the day in the classroom and hopes that she is a positive influence on the children, prompting and encouraging children to drink water.

Other Findings

Recycled water

Although not a focus on this study, a number of participants were compelled to discuss the issue of recycled water as an issue for themselves and their children. Of the participants that discussed that issue of recycled water, they appeared positive about the possibility of its implementation, P4, T1, T2, P6 and T3, except for P3 who

was opposed to the idea. In addition some participants mentioned water in the context of needing to be water wise due to current drought conditions, and educating children about the importance of conserving water.

"I have no problems with the water being treated. I believe that there's places overseas that you know treat the effluent and they can use it for dialysis machines so you know I don't have a problem with it". P4

"I think recycled water is an interesting issue. I think we can educate the students about the benefits of recycling water, and that would save a lot of emotional hassle that the council is going through at the moment". T1

"Maybe it's just an era of people that you know the message just twigged and water is healthy and then I suppose our drought conditions too you know, more people are aware of water and all of a sudden – don't waste water, and then were saying this is the drinking water, and maybe that's what's got through to people, maybe that we've been in a drought". P6

Fluoride Supply in Water

P1 talked considerably about the issue of a lack of a fluoridated water supply. She was concerned for her daughter's dental health. She stated that her daughter suffers from dental caries and had commenced on fluoride tablets to preserve her teeth.

"I was very happy recently to hear the discussion on the news about wanting to fluoridate the water. I think it's a good thing. But I don't feel that there's much benefit to them (her children drinking existing plain town water) without the fluoride in it". P1

"I think our water should have fluoride in it, because I grew up in Brisbane and that water tasted like swimming pool water that had a disgusting taste. But knowing it had fluoride in it was good". T1

Weight Control and Obesity

P4 and P2 encourage their children to drink water in an effort to reduce the chances of becoming overweight due to drinking too many drinks that contain high levels of sugar.

"I do think water is very important for them especially in their diet, in the way obesity is and things like that, if they drink water it's so much healthier". P2

"They say you know it's the answer to weight control (water). I've been told that the 8 glasses of water a day, it keeps you regular". P2

"***I think it's very important with myself if I try and lose weight, if I cut out any other fluids, if I just drink water, I tend to lose weight a lot easier". P3***

"Probably those kids that are obese I would nearly say are not drinking any water, they're probably drinking soft drink of some description, you know whether that be

coke or something, they're probably not even getting any healthy fluids into them at all". P6

One teacher T3 described one of her students as a "chunky little boy". In addition she states that the mother had been attempting to encourage him to drink more water in an effort to reduce his food intake.

"***I think though often you think you're hungry but you're thirsty. So kids can learn to drink more water and they might not always have those hunger pains". T3***

Another teacher T1 thought that the reasons for children being overweight were due to the following things:

"Sugar, lack of exercise and too much sugar. Too much you know takeaway food, not enough water and fruit, it's so basic". T1

Culture

One teacher recalled the influence of Ramadan for one of her students, which impacted on his water consumption behaviours.

"I have this little Muslim boy in our class that did Ramadan last month. And part of his religious belief is of course that you cannot drink any water which horrified me. And it's interesting that the other kids were saying you can have a little drink, and of course he wouldn't. I often wondered what state his body would be in by

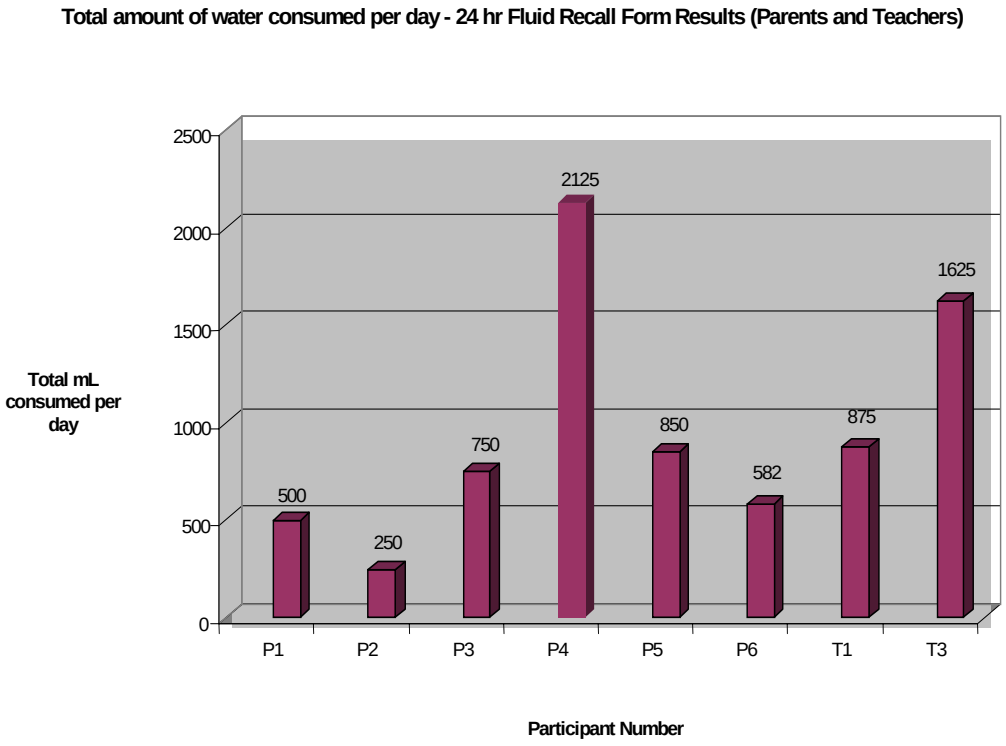
the end of the day. As a consequence we didn't send him to sports lessons because why would you go overheat his body when he won't drink". T3

24-hr Fluid Recall Form Results

The following graphs represent the findings collated from each participant's 24-hr Fluid Recall Form. All participants except for T2 had completed the form. Participants were asked to complete the form prior to coming to the qualitative interview. It was thought the interview process might in some way bias the responses on the Fluid Recall Form. Each person was asked to complete the table accurately in terms of what they had drunk during the previous 24 hours. A standard glass size was 250ml. An example of the 24-hr Fluid Recall Form is contained in Appendix B. Participants were instructed that if they had included water as part of fluids consumed, they were to ensure that it was plain water that they were drinking.

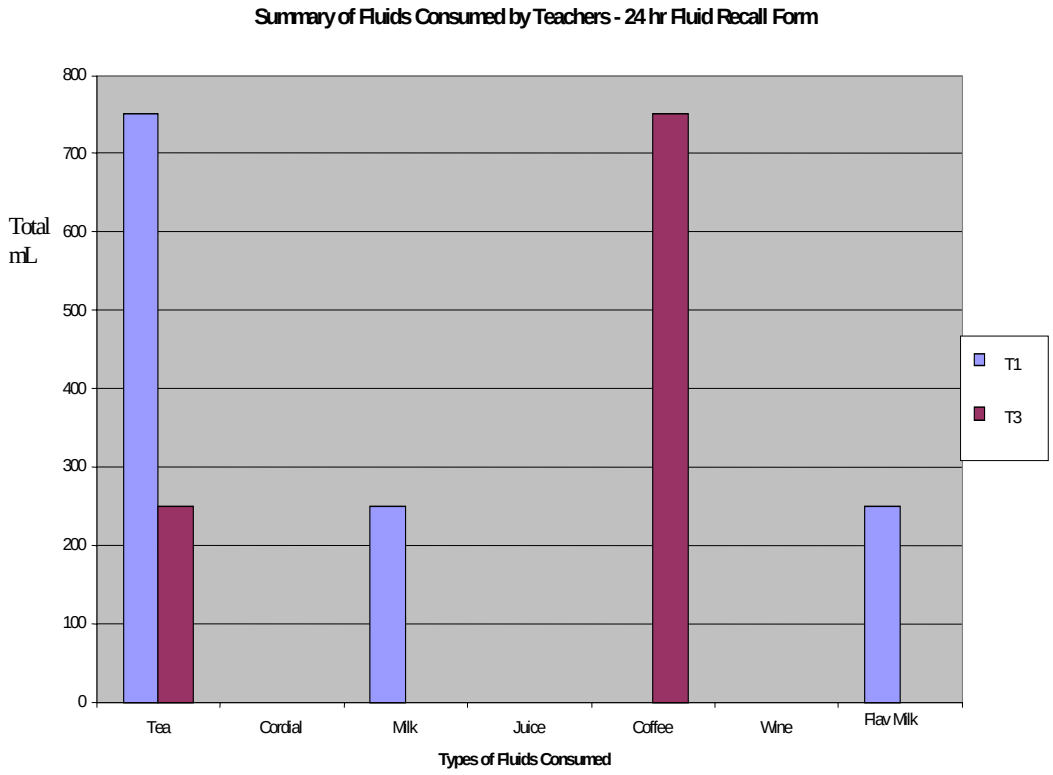
Table 4 showed the differences between parents and teachers in relation to how much plain drinking water was consumed in the previous 24 hours. P4 recorded consumed the highest amount of water in the 24- hour period with 2,125ml. With the exception of P4, both teachers had consumed more plain water than all other parents had. P2 reported drinking only 250ml (one glass of water) for the whole day.

Table 4: Total amount of water consumed per day by parents and teachers



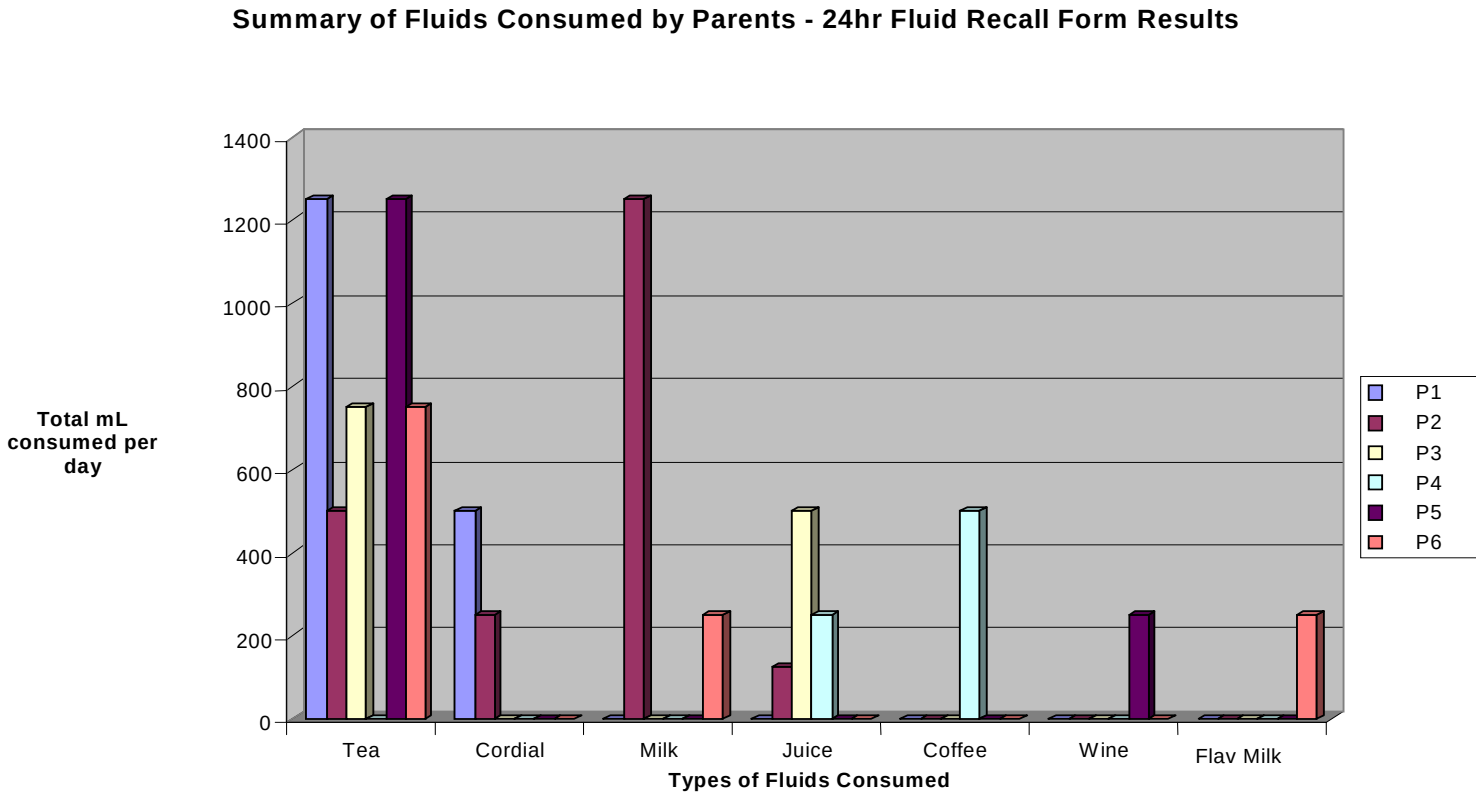
The next two graphs represent data collected in relation to other types of fluids that were consumed over that same time period. Table 5 below shows that for both teachers, tea and coffee were consumed in higher amounts than milk, or flavoured milk.

Table 5: Summary of fluids consumed by teachers



In contrast, this graph shows the types of fluids consumed by parents. It shows that tea appeared to be a most popular choice of drink for most parents and for 4 of the parents they had consumed at least 3 cups of tea during that period. Following tea, juice was the second most popular fluid that was consumed. P2 consumed the same amount of milk as other participants who had drank tea. Compared with the teachers' responses, the parents recorded a much broader range of fluids such as cordial, wine and flavoured milk.

Table 6: Summary of fluids consumed by parents



The final table below shows how parents and teachers reported various types of activities associated with what types of fluids they consumed. The most common types of activities reported were socialising, exercising, resting and consuming fluids at meal times.

Table 7: Types of Activities whilst consuming fluids

Participant Number	**Type of Fluid Consumed**	**Activity at Time of Consuming Fluids**
P1	Tea and Water	Drinks fluids when resting
P2	Tea, Cordial, Milk Juice and Water	Drinks fluids when resting Drinks fluids when socialising
P3	Tea, Juice and Water	Not specified
P4	Coffee, Juice and Water	Drinks water when exercising
P5	Water, Tea and Wine	Drinks fluids when exercising
P6	Tea, Water, Milk, Iced Coffee	Sips water whilst working
T1	Milk, milo, water, and tea	Drinks fluids at meal times and when socialising. Smaller amount when studying
T2		Form not completed
T3	Water and coffee	Drinks fluids when exercising. During water during teaching time. Drinks fluids with meals

CHAPTER 5: DISCUSSION OF RESULTS

This descriptive exploratory study explored parental and teacher influences on the consumption of plain drinking water by primary school aged children. Results indicated that there are barriers to drinking water in the school setting and that children are influenced by parents and teachers in terms of encouragement, role modelling and possibly their own fluid habits. This chapter will discuss these findings and the relationship and relevance to Social Learning Theory and applicability to Pender's Health Promotion Model.

The aims of this study were to:

1) investigate parents' and teachers' beliefs about water consumption by children whilst at school;
2) investigate how parents and teachers perceive themselves as role-models in relation to water consumption in children; and
3) investigate parents' and teachers' self-reported behaviour in relation to their promotion of water consumption

Findings

Parents' and Teachers' Beliefs about Children's Water Consumption at School

As discussed in Chapter 3 (Methodology), semi-structured interviews were conducted with parents and teachers. The intent of the interviews was to explore parents' and teachers' perceptions of water as a choice of fluid for children to drink, and to also explore attitudes and beliefs about their children's consumption patterns and their own role modelling behaviour.

The findings of this study suggest that both parents and teachers rate water (as a fluid for drinking by children) of high importance in terms of its place in a child's overall diet. Despite this, some participants discussed the importance of other types of fluids in a child's diet. These included fluids such as milk and juice. Some parents in particular, stated that 'variety' in their child's diet was very important to them eg including soft drinks, flavoured milk, cordial and occasionally sports drinks. These parents were concerned that without providing a variety of options for their child to drink, they were fearful of them not 'drinking much at all'.

Participants cited many benefits of drinking water that included improvements in complexion, increased energy and vitality, cognitive improvements (such as increased attention span and concentration), and a reduction of headaches. Furthermore, parents and teachers also discussed the role of water in decreasing the risk of dehydration, and were able to identify a number of physical and cognitive symptoms that could be indicative of a child with mild dehydration. Approximately half of the participants stated that a child saying that they were 'thirsty' was a possible sign of dehydration.

Parents and teachers appeared conscious of the need for children to drink more water during times of increased physical activity. They demonstrated this by verbally encouraging children to drink more. Parents packed water bottles for their child to take to school, and teachers ensured that children had access to the school bubblers, particularly after PE and sport. There is evidence that children have less tolerance of exercise in hot weather compared to adults (American Academy of Pediatrics, 2000).

The majority of participants reported drinking more in summer (so did the children). Children being encouraged and having easy access to water bottles in the classroom (especially in summer) was seen to be a very positive strategy. A number of parents were unsure if this practice of encouraging water bottles in the classroom occurred in winter. It was not clear from the teacher interviews whether this concern was validated. However, teachers commonly discussed physical signs in the children with 'red faces' and children being 'more thirsty' on hot days. They therefore appeared more active in hotter weather to encourage children to drink more water (such as taking the students directly to the bubblers on hot days for a drink). One parent stated that she thought dehydration was only an issue in summer.

The influence of climate was therefore an important factor that participants felt influenced their child's fluid consumption patterns. This lends support to the study of 4 year olds in Iran which found that dietary fluoride intake was significantly higher in summer than in winter (Zohouri & Rugg - Gunn, 2000).

Despite parents' and teachers' efforts to encourage children to drink water, their knowledge of how much water children should drink each day was varied. Clearly participants were unfamiliar of any recommended intake guidelines for children. Half of the parent participants stated that children should drink the same amount as adults. Most participants had stated that adults should drink between 6 – 8 glasses of water a day. Although, one participant stated that adults should drink 3 litres of water a day. This is alarming considering the detrimental effects that this amount of water consumed by a young child could have. This could lead to a condition called hyponatremia. This is defined as a condition where there is a "less than normal concentration of sodium in the blood, caused by excessive water circulating in the bloodstream". "In a severe case, the person may develop

intoxication with confusion and lethargy leading to muscle excitability, convulsions and coma" (*Mosby's Dictionary: Medical, Nursing and Allied Health*, 1990).

The researcher suggests that clear guidelines be developed and communicated within the community. This may be important for a broad range of people in the community and not just schools and parents, but may have implications for health services, sporting organisations and many other services that work with children. The current Australian Dietary Guidelines for Children and Adolescents merely state that children should drink plenty of water. However, it is argued this is not specific enough particularly for parents who want to ensure that their children are drinking enough. If parents are attempting to encourage their child to drink more, they need to have some guidelines as to how much more they should be encouraging them to drink (National Health and Medical Research Council, 2003b).

Some parents and teachers also stated that in terms of recommended amounts, they were unsure whether older children should drink a different amount to younger children.

Moreover, some parents stated that despite what they considered to be an ideal amount of water for their child to drink, they were not able to report accurately how much their child actually drinks. This problem arose because they had no way of knowing how much their child drinks at school either from the water bottle or swigging from the school bubblers, and also not being able to always observe what the children are drinking at home from taps and jugs in the fridge.

In terms of what children liked to drink, most children liked cooled water (especially in summer). A small number of children preferred water at room temperature. This is supported by Balding's (2004) study which found that when school students were asked about possible factors that would encourage them to

drink more water, their main responses were if 1) the water tasted better 2) if it was chilled or 3) if it was flavoured.

Some parents stated that taste and having a 'novelty factor' was a big factor in what the children preferred to drink.

Parents' and teachers' thoughts about the school's water drinking facilities were also explored. Problems reported were in terms of blockages of water bubblers (often with sticks or sand), poor temperature, poor taste, or handles being busted off. These findings were similarly found in a study by Walters and Cram (2002) who examined water facilities in schools in the UK and found that many taps and water fountains were often located in toilet areas and most were dirty, badly maintained, and highly contaminated. They found that the fountains that had a lower water pressure were more contaminated, presumably because of a greater contact with saliva, lips and fingers.

Concerns were also raised in relation to hygiene and cross-contamination. Parents and teachers raised concerns about how children were drinking from the taps (touching metal parts with their lips) and possible unhygienic hands touching handles and metal parts. A study conducted in the United States found that school water drinking fountains had more microscopic germs than toilets and door handles, stating that those things were more often cleaned and disinfected ("Millions of Germs and Bacteria Await Kids at School.," 2006). As a result of the hygiene concern, some parents discouraged their children from using the bubblers, preferring to pack their child water bottles from home.

Only one participant thought that there was an adequate amount of bubblers positioned throughout the school. A suggestion put forward by approximately half of the participants was that a water cooler should be placed in the classroom. Although

participants were unsure of the potential cost of this to the school, they felt that it would without question, lead to children drinking more water. The reasons were children would be tempted to drink the cooler water, it's more accessible, and lessened the risk of issues related to hygiene and cross-contamination. The success of this type of strategy is seen in the UK's 'Water is Cool in Schools' campaign (Brander, 2000) and the UK's 'Food in Schools' program. A range of strategies are implemented to promote and encourage water in the school environment, including supplying water coolers in every classroom, providing water bottles for children and providing education to students, parents and teachers. The aims of the 'Water in Schools' campaign are to 1) increase public awareness of the health benefits to children and young people of drinking adequate amounts of water regularly throughout the school day 2) to improve the quality of provision and access to fresh drinking water in primary and secondary schools and 3) obtain adequate government regulations for schools drinking facilities.

The Coolangatta State School (2002) used the Health Promoting Schools Framework to develop a nutrition policy. The policy supported the upskilling of teachers in nutrition issues, and that allowed students to bring a water bottle to school and drink water in the classroom throughout the day. They developed nutrition education programs for parents through workshops and newsletters and looked at greater ways of promoting healthy foods in the tuckshop. Policy direction proposed teachers not use lollies as a reward for children, and also encouraged children to brush their teeth while at school. In addition, they implemented a number of strategies to help influence healthy lunchbox ideas and also implemented a fruit and vegetable platter on a daily basis. Working towards creating a nicer eating environment was another strategy (Coolangatta State School, 2002).

In contrast, the School/Home Nutrition and Canterbury Kids Project (SNACKS) by the Central Sydney Area Health Service developed a teaching resource for encouraging water and fluid consumption in primary school-aged students. The manual attempted to provide some useful information for parents and at one stage encouraged parents to conduct a water survey with the school addressing accessibility, physical environment and encouragement. The manual however fails to address any underlying barriers by school policies, school culture, issues relating to teacher involvement, and participation levels by parents. Some of the learning outcomes expected in some areas of the manual want children to be able to make decisions as individuals and explain the consequences of health choices (Central Sydney Area Health Service, 1999). Clearly, this intervention fails to consider the broader influences from parents in this decision making process (O'Connor & Parker, 1995). Notwithstanding, there could be some short to medium term changes seen, but longer term change need to be reinforced by both school and family and changes made to the school environment to support the changes as evidenced by more multi-level approaches within a Health Promoting Schools approach (O'Connor & Parker, 1995).

Parents' perceptions as nutritional role models

Most parents reported being active in terms of encouraging their children to drink water by packing water bottles for school, filling up jugs of water in the fridge, and leaving coolers of water on benches at home. All parents considered themselves to be role models when it came to encouraging their children to drink water.

Of interest was the role that fathers played in encouraging children to drink water. Two participants stated that they thought that their husbands were quite 'health conscious' and that the children 'really paid attention to what they said', maybe more so than themselves. Parents described a range of roles in encouraging their children to drink water. These include:

1) educating their children about the importance and benefits of drinking water
2) prompting and encouraging children to drink water
3) reminding children to drink water before and after playing sport
4) regulating or monitoring sweet drink consumption
5) encouraging water with meals
6) assisting children to identify signs of dehydration
7) boiling and filtering water to increase palatability

The influence of a parent's fluid consumption patterns as a child were explored. This was to determine whether previous experiences had any impact on their child's consumption patterns or how this could influence their attitudes and beliefs about water. Milk was cited as a common drink when they were younger, and some participants consumed tank water. Fluids such as juices or soft drinks were consumed infrequently as they were 'seen more as a treat'. However, one participant recalled living in Far North Queensland where she drank lots of 'boring water'. To overcome this situation she drank a lot of cordial in an attempt to make it taste more interesting. Role modelling is apparent here as this has had an effect on her own child who also now drinks lots of cordial (this is the same child who suffers from dental decay).

A third of participants held negative memories of school water drinking facilities stating that they were dirty and that they avoided drinking from them. There were not clear links between the parent's previous negative childhood memories and whether this has had any direct effects on their children. However, several parents were active in providing water bottles for their children to avoid them using the school bubblers or discouraging them from using the bubblers. In addition, several parents made other comments such as the bubblers were 'disgusting' and that 'tap water was boring'. It is arguable that these types of comments could potentially have a negative influence on children drinking from the bubblers. Whether these actions are in part, a result of their own memories is not clear. This could be an issue worthy of further investigation.

Teachers' perceptions as role models

Teachers described a number of roles in relation to encouraging children to drink water. These include:

1) encouraging children to bring water bottles into the classroom to be placed on the student's desk
2) allowing students freely to access school bubblers
3) being a positive role model – drinking water themselves in front of children
4) encouraging children to access bubblers (especially after sport or PE), and on hot days (walking throughout the school)
5) promoting water in relation to improving student's singing abilities
6) educating the children about being water wise (in the context of water conservation)

Some parents stated that they felt that teachers could play a greater role in reminding younger children in particular to drink water. Other parents stated that they felt that in terms of educating their child about healthy choices, teachers would be more influential than themselves at 'getting messages across'. A number of parents reported having time constraints and as a subsequence, felt that they had very little time to spend with their child during the week, limiting the opportunity to address issues.

A small number of parents and teachers cited the Physical Education (PE) teacher as being a specialist teacher who is perceived to be a good role model for children in terms of nutrition, and also would be the most likely person to educate the children about nutrition related issues. While this may be the case it should be recognised that PE teachers have less time with the children than the teacher. All teachers need to accept the responsibility of educating children about the importance of drinking water.

Teachers appeared somewhat confused about where the issue of encouraging students to drink water would fit within the existing curriculum with some suggesting that it probably best fitted 'somewhere in PE'. One teacher did not perceive herself to be a nutritional role model but rather a significant other in children's lives. One teacher also stated that her undergraduate training contained little content in nutrition generally. Some teachers discussed the fact that they had done some education with children about water. However this appeared to be in the context of being 'water wise' and terms of conserving water due to the current drought conditions, rather than about water for drinking and its importance for health.

The teacher, who stated that she didn't see her role as addressing health issues at school, stated that her role was more in relation to improving a student's academic performance and improving their social skills. This may be suggestive that the teacher poorly recognises the link between good health and academic performance. The link between good health and improved academic performance has been well supported by the literature. Taras (2005) conducted a literature review of nutrition studies and found that school breakfast programs resulted in better verbal fluency, tests of attention, memory, creativity and cognitive and academic performance. Interestingly the abovementioned teacher also discussed the importance of children drinking water to increase their energy levels, prevent headaches and help them to "stay awake". Clearly these factors could have an impact on a student's academic performance.

Only one teacher actively encouraged children to drink water in the classroom by reminding them to bring water bottles and informing parents about the strategy at parent information nights. The National Framework for Health Promoting Schools (2000-2003) (Commonwealth Department of Health and Family Services, 2000) report concludes that 'teachers are key figures in the lives of children'. In addition, they "are often in a position to facilitate the development of resilience, and can have a favourable impact on student's lives". Yaussi (2005) states that teachers have a range of roles in promoting good health. These include education, making changes in the classroom to engage children in healthy behaviours, creating reward for healthy behaviour, and developing better communication about their own healthy interests and goals.

Parents' and teachers' self-reported behaviour in relation to their promotion of water consumption.

In terms of parents' own fluid consumption behaviours, data were collected from the semi-structured interviews and the 24-hr Fluid Recall Form. The findings suggest that some parents consumed very little plain water, and consumed a greater variety of drinks than teachers in the study. Some parents stated that they did not think that what they drank in front of their children would have any influence on their children and the choices that they would make.

For teachers, the 24-hr Fluid Recall Form data revealed that drinking water and coffee or tea were the most likely drinks to be consumed. Two of teachers actively drank water in front of children in the classroom. They hoped that this would have a positive influence on children by being a role model.

Study Findings and Their Relevance to Social Learning Theory and Applicability of Pender's Health Promotion Model

Within this study a number of factors were found to have a social basis which it could be argued may have an influence on children's water consumption. These may include the following:

1) Social comparison – children bringing water bottles into the classroom because most of the other children do.
2) Influence of peer pressure – children mainly bringing water bottles to school. Influence of others drinking from school bubblers. 'Novelty factor' in the popularity of 'play water'.
3) Positive reinforcement – music teacher promoting water for improved singing. Allowing some students (with good behaviour) to fill up the

teacher's water bottle on request. Teacher bringing extra water bottles in for children who may have forgotten to bring theirs to school.

4) Parents and teachers role modelling drinking water in front of children – drinking water from bottles, filling up water jugs, filtering and boiling water, drinking water whilst exercising.

Pender's Health Promotion Model was used in this study to assist in understanding a range of factors which could contribute to health-promoting behaviour and also identify factors that could be barriers for healthy behaviour (Pender, 1987). It could be argued that drinking water is a healthy behaviour. As such the findings of this study are suggestive that the perceptions that teachers and parents have about water, may have an impact on children's water consumption. This can be seen in terms of the high importance placed on water as a choice of fluid and how both teachers and parents encourage and promote water consumption via a range of strategies.

In addition, the application of this model has highlighted a number of barriers in increasing children's consumption. Some of these include 1) the school's water drinking facilities 2) limited knowledge of participants in terms of recommended intake of water for children 3) some uncertainty of the role that teachers could play in the school to terms of educating the students about the importance of water for drinking 4) the belief that drinking water is more of an issue in summer than winter 5) some teachers placing little importance on the issue and perceiving that another specialist teacher would be more in a position to address water in terms of being part of nutrition education and 6) perceived time constraints by parents to be able to accurately monitor their child's intake.

In contrast, this study found a number of factors that contribute towards encouraging children to drink water. In the school setting these include: 1) teachers encouraging children to drink water in the classroom from their water bottles 2) encouraging children to use the school water bubblers and 3) school tuckshop providing bottles of water for sale.

Under the cognitive – perceptual section of Pender's Health Promotion Model, the concept of self-efficacy (having the belief that you can do something and have the skills) is included. Within this study, some parents talked about a number of challenges. These included 1) being able to monitor their child's consumption of water accurately and 2) feeling like teachers may be able to influence their child more than they could. In addition they also discussed their own water drinking behaviours which highlighted problems in being able to establish drinking water as a 'habit' and remembering to drink water at all.

In summary, this study has explored parental and teacher influences on the consumption of plain drinking water by primary school aged children. As discussed, there are a number of identified barriers to drinking water in the school setting. In addition, children are greatly influenced by parents and teachers in terms of encouragement and role modelling. Chapter 6 will provide an outline of the limitations of the study, recommendations for schools and those involved in developing population based nutrition guidelines and finally will provide recommendations for further research.

CHAPTER 6: CONCLUSION

This Chapter outlines limitations of this study, recommendations for promoting and improving adequate water consumption, and finally providing recommendations for further research. It will highlight the need for schools to adopt a whole of school approach involving parents, teachers, students and the broader community, in providing a consolidated and sustainable multi-level strategy to improve the health and wellbeing of young children.

Schools have been described as important settings for health promotion, and as such, are environments whereby parents and teachers and the greater community can work together to promote the health of children (Australian Health Promoting Schools Association, 1997). This study supports the idea that children should bring their own water bottles into the classroom. This is seen as a positive strategy. In addition, there are opportunities for the school to promote drinking water as a healthy behaviour. A number of parents and teachers suggested that water coolers could be a good alternative to the problems that they highlighted with current school water drinking facilities. Finally, there are also opportunities to promote water as a good choice of fluid throughout the whole year and not just in the hotter part of the year. An excellent example of how schools can implement change is the UK's 'Food in Schools' program. It provides a whole of school approach by providing information to schools on the benefits of drinking water, a step by step plan for schools to assess current water provision and how to implement practical ways of promoting the benefits of drinking water in the school community with students, parents and children.

Limitations of the Study

Participants were selected by purposive sampling (particularly those parents identified as having a role in the school tuckshop). Their views and perceptions may not be representative of other parents' views in the population and therefore the findings cannot be generalised.

The use of only one school may be seen as a limitation because each school's physical environment (ie location of water bubblers) may be different and therefore may not be indicative of all schools.

A small number of teachers were included in the study despite attempting to involve more teachers. There could be a number of reasons why more teachers did not participate in the study possibly including time constraints and their perceived value of the study. One teacher failed to complete the 24-hr Fluid Recall Form, despite attempting to engage her in the process.

Participants poorly recorded on the 24-hr Fluid Recall Form. This was particularly in relation to the types of activities performed when drinking fluids. This was possibly due to the recall form being too broad. An alternative may have been to develop a short survey to investigate fluids and activity levels.

Recommendations:

A number of strategies could be developed to contribute to the promotion and encouragement of children to drink water. Some of these strategies may include, but are not limited to:

1 acknowledging within the school community that water bottles in the classroom is a positive strategy – parents to be actively encouraged to pack water bottles for their children.

2 education about the signs of dehydration – teachers, parents and students. Promotional material could be placed behind toilets doors such as posters that assist in identifying colour of urine to assess hydration status.

3 education about importance of children drinking water in winter and also drinking regularly throughout the day.

4 applying guidelines from the UK's 'Food in Schools' initiative as an example of a 'whole of school approach' to implement practical strategies that consists of curriculum links, management of water provision, increasing teacher and improving student and parent understanding of water for health. The PE teacher could be seen to be pivotal in being a strategic person in promoting healthy behaviour.

5 educating students about hygiene issues – maybe develop posters near water troughs reminding them not to put their mouths over the taps.

6 the development of a 24- hr Fluid Recall Form for use in nutrition related studies.

7 development of clear recommendations of daily intake of water for children and adolescents.

Areas for Further Research:

An area for further research may include the development of an Australian 'whole of school approach' such as the UK's 'Food in Schools' initiative. This would need to be achieved by working with parents, teachers and the broader community to encourage water consumption.

The concept of enhancing a child's cognitive functioning at school by drinking adequate amounts of water, is worthy of further investigation. This could be achieved by measuring physical or cognitive functioning. Teachers and parents felt that there could be possible positive effects of cognitive functioning eg children being more alert better able to concentrate and had perceived higher energy levels.

In addition, further research could be done into measuring the effects of using water coolers in classrooms (or other strategies developed by the school) to determine whether this has a positive influence on increasing a child's water consumption behaviour.

Conclusion

In conclusion, the results of this study demonstrated that:

1) parents and teachers had limited knowledge about how much water children should be drinking
2) allowing children to bring water bottles in the classroom is a positive strategy in encouraging children to drink regularly throughout the day
3) there appeared to be barriers to children drinking water in the school environment and
4) a whole of school approach is needed (working with parents) to promote children drinking water.

The findings from the interviews also suggest that any strategies developed within the school environment, should take into account children's taste preferences and address the 'novelty factor' that children seem to respond to.

As this study has demonstrated, schools can provide an important setting for the promotion of health. The development of interventions within the school environment are worthy of further investigation. The UK's 'Food in Schools" program may be of great assistance in developing a practical 'whole of school approach'.

Finally, this study has demonstrated the importance of teachers and parents as significant people in a child's life. In terms of promoting healthy behaviours (drinking water), their roles together provide a firm foundation with which healthy environments are created and sustained. These environments are critical in terms of children understanding the importance of drinking water and developing healthy behaviours in the short and long term.

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APPENDIX A: 24-hr Fluid Recall Form

This chart is to help us to understand your usual fluid intake habits. We would encourage you to continue your normal intake of fluids. If you like you can record as you go or complete this chart on the next day.

1 Standard Glass size = 250 mls.

At the end of this chart is a picture of a standard size glass to help you to work out how much you are drinking.

Please record your intake based on glass size e.g. 1 glass, ½ glass.

You may include on the chart any fluids that you have consumed throughout the day including (tea, coffee, juice, softdrink, plain water, soup etc).

TIME OF THE DAY	**TYPE OF FLUID CONSUMED**	**DESCRIPTION OF WHAT YOU WERE DOING AT THE TIME (e.g. exercising, having morning /afternoon tea).**
Breakfast		

Morning Tea		
Lunch		

Afternoon Tea		
Dinner		

Supper		

(example of a standard glass size) 250mls

APPENDIX B: PARTICIPANT INFORMATION SHEET

Dear Parent / Guardian,

You are invited to take part in this research project

Your child's school is very interested in providing the best environment for your child to learn in. The purpose of this study is to get a better understanding of the influences from teachers' and parents' in relation to children drinking plain water. The information from this research may be useful not only for your child's school but also for generally for parents. Teachers from your child's school have also been approached to participate in this research.

Your participation would involve 2 steps:

1. An interview with a researcher from the University of Southern Queensland for approximately one (1) hour. This is planned to occur late 2005. This would involve questions about your attitudes towards drinking plain water and ways in which you may be influencing your child's consumption. You may also be asked about generally about your child's fluid intake and thoughts about water in the school environment.
2. We are also interested in knowing the types and amounts of fluids you may be drinking each day. This research will ask you to complete a 24-hour (1-day) fluid diary. A simple sheet would be provided to record amount of fluids consumed.

What you might personally get out of this!!

- Knowing that you have contributed to a greater understanding about drinking water.
- May help you to think about your own thoughts about water and what effect this may have on your child.

Your participation is entirely voluntary and you are free to withdraw from the study at any time. To do this you only need to contact one of the persons whose name appears at the bottom of this flyer. This will not in any way affect your child's education or services provided by visiting local health services. If you do withdraw, the interview and transcript will be deleted from any of the researcher's files and not used in analysis. To ensure confidentiality, you will be asked to provide an alias name for the interview. All information is strictly confidential and your name will not be provided to the school. No results will be used for any other purpose than this water consumption research.

The data from your interview will be held in a computer file with password protection. This password is changed every 90 days to ensure the information is kept safe. On completion of the study all computer files will be transferred to a computer disk and the computer hard drive cleaned. All project material including the informed consent will be stored in an archived area for 5 years, after which time it will be treated as confidential waste and destroyed.

This study has been reviewed by the USQ Ethics Committee. Should you wish to discuss the study with someone not directly involved, please feel free to contact the Secretary, USQ Human Research and Ethics Committee on **46 312956**.

Principal Researcher: Mrs Lisa Beccaria, Master of Health Student, Faculty of Nursing (University of Southern Queensland), Work Contact: 46166812. Supervisors: Dr Elizabeth Buikstra and Dr Tony Fallon, University of Southern Queensland,
Contact: 46315443.

APPENDIX C: CONSENT FORM

PROJECT: Teacher and Parental Influences on the Consumption of Plain Drinking Water on Primary School-Aged Children

NAME OF PRINCIPAL RESEARCHER:

Mrs Lisa Beccaria (USQ Master of Health student)

SUPERVISORS:

Dr Elizabeth Buikstra and Dr Tony Fallon, University of Southern Queensland

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I have read and I understand the information on the Participant Information Sheet. I am aware that my participation is voluntary, and that I can withdraw from the study at any time, thereby not affecting my child's education or services provided by visiting local health services, by contacting Mrs. Lisa Beccaria, Dr. Elizabeth Buikstra, or Dr. Tony Fallon. I agree that the information that I contribute to the study can be published as long as I cannot be identified in any way.

Participants Name (please print)…….

Signature……..Date……

Researcher's Name (printed)……..

Signature……..Date……

APPENDIX D: INTERVIEW QUESTIONS

Teacher Group
Importance of Health: Are you concerned about what the student's drink in a day? How important do you think it is for children to drink plain water each day? How important do you think is the issue of drinking water at school for children is?
Perceived control of health: Do you think peer pressure has a part to play in whether children will / or will not drink water? What are some of the pressures that you feel are being placed upon teachers to ensure schools are environments for healthy behaviour?
Perceived self-efficacy: Can you describe how you have encouraged students to drink more water at school? How would you describe general compliance with new strategies that may promote better health?
Perceived health status: Do you consider yourself to be healthy?
Definition of health: If you do not consider yourself healthy, do you think that by drinking more water would make you feel more healthy?
Perceived benefits of health-promoting behaviour: What benefits do you see for drinking water?

Interpersonal Influences: How do you feel about the greater role that schools are playing in terms of what children are allowed to drink or eat?
Behavioural Factors: Can you describe your own water drinking habits? How would you describe what you feel when you have a drink of plain water?
Likelihood of engaging in health-promoting behaviours: What might be some factors that might influence whether you would drink more water?

APPENDIX E: REVISED TEACHER INTERVIEW QUESTIONS

How would you describe your current health?	How would you describe the general health of your students'?
What impact does drinking plain water have on your health?	What impact does drinking plain water have on your students' health?
Roughly how much water do you think you should drink in a day?	Roughly how much water do you think your students' should drink in a day?
	How would you know if your students' were drinking enough water during the day?
	In terms of all the fluids that the students drink, how do you rate plain water in comparison with them?
What are the benefits of drinking water?	
How much water do you think you need to drink in order to be healthy?	
What impact does your fluid intake have on your students' drinking habits?	
As a teacher, what is your role in influencing your students' drinking habits?	
Other than yourself, what else might influence your students' drinking habits?	

What do you think of the school's water drinking facilities? What do you think could improve them?	
What role do you think parents play in promoting children to drink water?	
What factors might influence you to drink more water if you aren't drinking enough?	What factors do you think might influence your students' to drink more water if they are not?

APPENDIX F: REVISED PARENT INTERVIEW QUESTIONS

**** This symbol refers to those questions that had been modified during the interviews due to feedback from participants that some were repetitious, or needed to be more specific.

1.What impact does drinking plain water have on your health? In terms of your diet (including food and fluids) how important do you think water is towards maintaining your health? Is the need to drink water something you think about? In terms of all the fluids you drink, where do you place water in terms of preference? E.g. taste, social occasion, relaxation?	2.What impact does drinking plain water have on your child's health? In terms of all the things that your child eats and drinks, how important is water in maintaining their health?
Roughly how much water do you think you should drink in a day? ****Roughly how much water do you think you need to drink in a day to be healthy as an adult?	Roughly how much water do you think your child should drink in a day? ****Roughly how much water do you think children need to drink in a day to be healthy?

**** Are their any body signs or feelings that you may have that effect your need to drink water? Are their times when you would make a choice not to drink water or drink smaller amounts?	What signs would you notice to know if your child was drinking enough water? Can you describe ways in which you have encouraged your child to drink water?
	In terms of all the fluids that your child drinks, how would you rate plain water in comparison with them? ***** In terms of all the things that your child drinks e.g. milk, fruit juices, sports drinks, softdrinks, water etc how important is water in comparison with them. E.g is milk more nutritious or important than water, is juice more important than water etc. How much water do you think your child would drink in a day? Are their others factors that may require them to drink more?

	Do you think that they are drinking enough? Would you like them to drink more water? What do you think would encourage them to drink more? ******* Are their times in which you may encourage or discourage certain drinks for your child? E.g certain activities, occasions, treats, playing sport, general health and wellbeing, behaviour. Do you have discussions with your child about the importance of drinking water?
What are the benefits of drinking water? *** What do you perceive to be the benefits of drinking water? Does water have benefits over other types of drinks? Do some of the other drinks have benefits over water?	Can you describe any preferences that your child has when drinking water?
How much water do you think you need to drink in order to be healthy?	

**** Delete this question	
What impact does your fluid intake have on your child's drinking habits? I want you to think about your own fluid drinking habits eg how much you drink, what you drink and when you think them. Can you describe how your choices may effect what your child may drink on a daily basis?	
As a parent, what is your role in influencing your child's drinking habits? ***** Are their ways that you think you can make a difference in what your child will drink? Are there times when you find it difficult to healthy choices of drinks?	

Other than yourself, what else might influence your child's drinking habits? ********** Who or what else around your child could effect what types of drinks that are drinking?	
What do you think of the school's water drinking facilities? What do you think could improve them? ****** Do you have any concerns? Do you encourage your child to drink from the water supplied in the school? Can you describe the supply of water in the school tuckshop?	
What role do you think teachers play in promoting children to drink water? **** Do you think teachers have a part in encouraging children to drink water? In what way? Could teachers do more? Do you think that a teachers water drinking habits might have an influence on the children's attitudes towards water?	

How would you describe your current health?	How would you describe your child's health?
What factors might influence you to drink more water if you aren't drinking enough?	What factors do you think might influence your child to drink more water if they are not?

APPENDIX G: USQ ETHICS CLEARANCE

AUSTRALIA

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Postgraduate and Ethics Officer
Telephone: 0746 312956
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6 September 2005

Ms Lisa Beccaria
7 Groom Street
Toowoomba Qld 4350

Dear Ms Beccaria

Re: Ethics Clearance for Research Project, *Parental and Teacher Influences on the Consumption of Plain Drinking Water for Primary School-Aged Children*

The USQ Human Research Ethics Committee recently reviewed your application for ethics clearance. Now that you have addressed the concerns of the Committee your project has been endorsed and full ethics approval is confirmed. Reference number **H05STU499** is assigned to this approval that remains valid to 6 September 2006.

The Committee is required to monitor research projects that have received ethics clearance to ensure their conduct is not jeopardising the rights and interests of those who agreed to participate. Accordingly, you are asked to forward a **written report** to this office after twelve months from the date of this approval or upon completion of the project.

A questionnaire will be sent to you requesting details that will include: the status of the project; a statement from you as principal investigator, that the project is in compliance with any special conditions stated as a condition of ethical approval; and confirming the security of the data collected and the conditions governing access to the data. The questionnaire, available on the web, can be forwarded with your written report.

Please note that you are responsible for notifying the Committee immediately of any matter that might affect the continued ethical acceptability of the proposed procedure.

Yours sincerely

Christine Bartlett
Postgraduate and Ethics Officer
Office of Research and Higher Degrees

Copy: Dr E Buikstra