KNOWLEDGE, ATTITUDES AND PERCEPTIONS OF URBAN SCHOOL CHILDREN AND THEIR MOTHERS REGARDING BREAKFAST.

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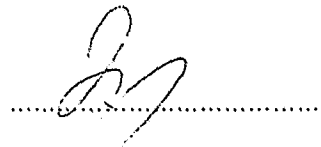
A thesis submitted to the Faculty of Health Sciences, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Masters in Family Medicine

Declaration

I, Dr Patricia Celaya declare that this research report is my own work. It is being submitted in partial fulfillment for the degree of Masters in Family Medicine at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

This study has received ethical approval from the University of the Witwatersrand's Committee for Research on Human Subjects (Medical) and the approval number is:
M 970407.



Dr P. Celaya

Dedication

To my family.

Abstract.

The purpose of this study was to explore and to compare the awareness and attitudes towards breakfast among urban school children and their mothers, and to describe the products consumed by children at breakfast. An attempt was made to establish a relationship between children's school performance and the consumption or omission of breakfast and to explore different reasons why children omitted breakfast.

A cross-sectional descriptive study was conducted among two groups of primary school children attending four urban schools in Johannesburg. These two groups were selected randomly from all the Grade 3 and all the Grade 7 classes in each of the schools. The children's mothers/guardians and their teachers were also asked to take part. Grade 7 children, all the mothers/guardians and the teachers were asked to answer a self-administered questionnaire. The researcher conducted personal structured interviews among the Grade 3 children. The collection of the data took place in November 1997.

This study showed a low daily consumption of breakfast among both groups of children (only 65.7% of Grade 3s and 51.4% of Grade 7s consumed breakfast daily). The study also showed that a larger number of girls (58.2%) than boys (54.2%) had breakfast daily. The consumption decreased significantly among girls with increasing age: 80% of Grade 3 girls had breakfast daily compared to 49.5% of Grade 7 girls (p 0.003). The consumption of milk was found to be low: 25% of Grade 7s consumed milk on weekdays while the overall consumption among Grade 3s was 12.3%. Similar attitudes and perceptions regarding breakfast were found between children and their mothers.

No relationship was found between breakfast consumption and school performance among both groups of children.

It was observed that the main factor responsible for the omission of breakfast among the group studied was lack of time for its consumption.

Acknowledgements

I wish to acknowledge the following people:

My supervisor, Dr Anne Wright from the Department of Family Medicine at the University of the Witwatersrand, for her patient teaching, encouragement and support.

Professor Bruce Sparks, Head of the Department of Family Medicine for his support throughout this project.

Mrs Feldman, senior teacher at Greenside Primary School and Dr A.R.P Walker from the South African Institute of Medical Research for their experienced advice during the initial stages of this research.

Mrs E. Viljoen from the Medical Research Council, for the statistical analysis of the data.

All the school principals who gave permission for this study to be conducted, and all the teachers, children and mothers who agreed to take part.

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Chapter 1.

1.1 Introduction.

Although the relationship between breakfast consumption and improvement in school performance has not yet been completely demonstrated, the important role that breakfast plays in nutritional well-being of children has been highlighted [1].

Breakfast is one of the main meals which makes a valid contribution towards the daily nutritional requirements, hence its omission is expected to have a negative impact on children's nutrition. It is known that the causes of malnutrition are many and that socio-economic factors play an important role, but it is also known that other factors such as ethnicity, education and the influence of family and peers are expected to affect children's eating habits.. In communities where poverty is not prevalent and children's nutrition is still not optimal, these factors have to be identified to be able to implement appropriate interventions.

Are eating habits likely to detericrate with increasing age? If so, is this deterioration significant among children of both sexes? Is the influence of parents, siblings and peers important enough as to be taking into consideration? How prevalent is the lack of knowledge about health and nutrition among school children and their mothers in the more affluent urban schools? All these questions need to be answered before deciding which interventions will be more appropriate for each particular group of children.

Nutritional supplementation by means of school feeding programs are costly, difficult to implement and their benefits are still controversial, especially among older children. Perhaps other easier and less costly means of improving children's nutrition can be found by adopting a more holistic approach involving factors other than socio-economic.

It is important to identify which problems contribute the most towards the inadequacy of children's diet in each particular society or school, and to target those specifically. Which age group of children will benefit the most from a particular intervention and whether parents should be involved has to be established.

Can schools afford to implement nutritional education programs? If the main areas in need of attention in a particular school are identified, perhaps the school can include such a program in the curricula for older children or as a play approach for children of younger age.

With regards to family practitioners, they are expected to give nutritional information and advice to their patients as part of opportunistic health prevention. In order to realise this expectation, they need to be aware of, as well as become involved in, the prevention of children's malnutrition in their communities.

1.2 AIM AND OBJECTIVES

1.2.1 Aim

To explore the knowledge, attitudes and perceptions of school children and their mothers regarding breakfast.

1.2.2 Objectives

(a) To compare children's attitudes and awareness regarding breakfast in relation to their age, sex and ethnicity.

(b) To explore children's breakfast eating behaviour: different foods and drinks consumed at breakfast.

(c) To explore the relationship between breakfast consumption and school performance.

(d) To explore mothers' knowledge and attitudes regarding breakfast.

(e) To compare findings between children and their mothers regarding their knowledge and attitude towards breakfast.

(f) To explore possible reasons for children omitting breakfast.

1.3 DEFINITION OF TERMS AND ABBREVIATIONS

1.3.1 Definition of terms

Breakfast (bf): The Oxford English Dictionary defines breakfast as "the first meal of the day". For practical reasons the researcher had applied this term to any food or drink consumed since getting up in the morning until the first period of school.

Grade 3: Previously known as Standard One, it is the third year of schooling in South Africa.

Grade 7: Previously known as Standard Five, it is the seventh year of schooling in South Africa and the last year of primary school.

1.3.2 Abbreviations

G.P. Greenside Primary School

Y.B. Yeoville Boys Primary School

J.G.P.S. Johannesburg Girls Preparatory School

H.F. Holy Family Convent

Chapter 2.

Literature Review.

Although the question of whether breakfast makes a difference in school performance has not yet been accurately answered, the literature highlights the important contribution that breakfast makes towards the daily nutritional requirement of children[1]. Researchers have agreed upon the fact that breakfast should contribute one quarter of the daily nutritional requirements [2,3,4] the importance of the type and amount of food consumed, as well as its distribution throughout the day has been emphasised [4].

Nutritional research has indicated that the omission or the consumption of a sub-optimal breakfast might cause dietary inadequacies, which are seldom made up by other meals consumed during the day [5,6,7].

Authors [4] have stressed the beneficial effects that increasing the variety of food children consumed at breakfast had on improving physical and intellectual performance, and on the promotion of a better nutritional and health status. The fact that skipping meals had a negative effect on children's nutrition has been emphasised [5,6,7]. It has also been shown that the 24-hour nutrient intake of children who ate breakfast was better than that of those who skipped it [7,8].

The relationship between the consumption of breakfast and improvement in school performance has not yet been completely demonstrated. In South Africa, in 1982, Walker *et al* [2] analysed the breakfast eating habits of 4717 adolescents from different ethnic groups, aged 16 to 18 years. They concluded that the issue of "breakfast or no breakfast" had no

influence on either anthropometric measures, class position or in the frequency of absence from school.

In a review of the literature published after 1978, Pollitt[10] reported that no definitive conclusion could be made on the relationships between glucose levels and performance after fasting. He explained that the progressive decline in insulin and glucose that takes place after an overnight fast, could determine, when the fast is prolonged, a stress response that would interfere with different aspects of cognitive function. In the same review he stressed the finding that, independently of the research setting, breakfast consumption improved cognitive functions of undernourished children.

Pollitt *et al* [10,11,12] conducted studies among 9-11 year old children in Cambridge and Houston where they found that children committed fewer errors on the Matching Familiar Figure Test the day they ate breakfast. The Matching Familiar Figures Test (MFFT)[13] is used to measure cognitive function and it is sensitive to the omission of breakfast

Using different tests, among them the MFFT, Simeon and McGregor found that cognitive functions were more vulnerable to missing breakfast in poorly nourished children[13]. This finding was also observed by Politt [10] who in his review of the importance of breakfast in school performance, concluded that, although no definitive statement could be made regarding the relationship between glucose level and school performance after an overnight and morning fast, there was enough evidence to indicate that working memory in undernourished as well as in well-nourished children, was affected by these factors.

Brown and Sherman[14] explain that the contradictory results obtained by different researchers when trying to analyse the relationship between breakfast and school performance, was due

to the fact that IQ test and school performance measured by standardised testing, appear to be inappropriate to assess the impact nutrition has on children's learning abilities. Philosophy and structure of learning (which can not be measured with I.Q tests) reflect the more complex interaction which is presently known to exist between nutrition and behavioral, emotional and cognitive development.

In a study conducted in South Africa, Steyn *et al* [15] analysed children's and teachers' perceptions of a primary school nutrition program. The scope of the program was to provide children with an early morning snack which met 30% of the daily nutritional requirements. Twenty-seven teachers located in four different South African provinces were interviewed. Over 80% of them agreed about the beneficial effects breakfast had on children regarding concentration, physical activity and appearance, as well as in reduction of truancy.

The omission of breakfast could contribute towards dietary inadequacies in children especially affecting those who are at nutritional risk [10]. Experimental research conducted on rats[16] has shown that early malnutrition causes alterations in various neurotransmitter systems. While neuronal structures showed a recovery after nutritional rehabilitation, the alterations in non-neuronal structures, i.e. brain myelin, was found to resist rehabilitation. It is believed that myelinated axons transmit information at higher speed than non-myelinated ones, thus its reduction could be of functional importance.

According to a national survey conducted in Souh Africa [17], 33% of children younger than 6 years of age suffer from subclinical Vitamin A deficiency and 21% of them from anaemia. It was established that 2.3 million South Africans were nutritionally compromised, and 89% of them were Black children under the age of twelve [18].

Local studies have emphasised the problem of malnutrition among various populations. In the Richtersveld, Steyn *et al* [19] in a survey conducted among coloured children aged 7 to 14 years, found that more than 60% of them presented with chronic and acute malnutrition due to a diet low in energy and protein. A study conducted in the Western Cape by Steyn *et al* [20] among 11-year-old children of different ethnic groups, found that the percentage of black urban boys and girls falling bellow the 5th percentile for height-for-age (stunting) was 17% and 14% respectively.

Malnutrition constituted the lack, excess or imbalance of one or more nutrients required to maintain a normal nutritional status and optimal health [22]. It was important to consider the concept of "mild malnutrition" as defined by Wachs [23] : "It is a level of intake of energy or specific nutrients that is below the recommended daily allowance, which is associated with less than adequate physical growth and/or changes in metabolism, but not to the degree that would lead to significant wasting, stunting or clinical symptoms".

Schurch [24] has discussed the shifting of nutritional scientists' outlook regarding the main causes of malnutrition during the last fifty years, from highlighting the importance of vitamins in the 40's, the lack of proteins in the 50's and the lack of dietary energy in the 70's, to the present view which recognises the deficiency of micro-nutrients such as iron, iodine and vitamin A that could result in multiple impediments to children's optimal health and development. Vorster and Venter[25] have expressed the opinion that micro-nutrient deficiencies which are the form of malnutrition commonly found among children in the United States of America, should be expected among South African children, expectations which were later confirmed [17] .

At present, there is convincing evidence from nutritional supplementation trials, showing that lack of specific micro-nutrients have an effect on the behavioural development of children [24] .

Bread, ready-to-eat breakfast cereals and milk, have been mentioned as important contributors towards the daily micro-nutrient and protein intake. Due to its frequent consumption in South Africa, bread is considered a "core food" which is defined as a food routinely consumed by a population group [26] . Although bread is a poor source of vitamin A, C, riboflavin and B12 [26] it is a high source of protein [27]. The protein content of the 10 different breads commercially baked in South Africa ranged from 8.3g to 11.7g per 100 grams [27] These breads could make a valid contribution to the daily diet. Some of South African breads have been enriched and 250g portion of these breads (8 slices) supplied 25% of the recommended daily allowance of thiamine, riboflavin, niacin, pyridoxine, folic acid and calcium [22] . Although brown and whole wheat bread were shown to have more micro-nutrients than white bread, they also had a higher content of phytates, which decrease the absorption of zinc, calcium and iron [28] .

Ruxton *et al* [29] found that the consumption of ready to eat breakfast cereals was associated with increased intake of micro-nutrients, both at breakfast and in the overall daily diet, as well as a reduced percentage of energy obtained from fat. Regarding milk consumption, in a study conducted among 7-8-year-old Scottish schoolchildren, Ruxton, Kirk and Belton [30] found that children having a high milk consumption (more than 3 litres per week) had better intakes of micro-nutrients than those children having medium (1-2.9 litres per week) or low (less than 1 litre per week) milk consumption; daily intakes of Vitamin A, iron, folate, zinc, and selenium were significantly higher in the "high consumption" group. In South Africa, Voster and Venter [25] have highlighted the important contribution that 200 ml of milk made towards the daily nutrient requirements of children between the ages of 7 and 10 years. In this age

group, 200ml of milk supplies 20-30% of daily requirements of protein, calcium, riboflavin and vitamin B_{12}. Consumption of milk was found to be higher in European countries than locally. In Spain, Ortega *et al* [1] in a survey conducted among children aged 9 to 12, found that 53% of them consumed milk. In a nutritional survey conducted in France by Preziosi *et al* [31] among 1008 subjects between the ages of 2 and 97 years, they found that more than 80% of children and adolescents consumed milk regularly. In South Africa, Wolmarans *et al* [2] analysed breakfast patterns of primary school children in low socio-economic areas in Pretoria and West-Rand. They recommended that serious attention should be paid to the milk consumption of African school children. They found that a great percentage of African children ate bread mainly and an unacceptable high percentage of them used non-dairy creamers, which have no important nutritional value and should not be used as milk substitute. They also suggested that milk be supplemented by, for example, bread, margarine or peanut butter in order to meet the recommendation that breakfast should provide at least one quarter of the daily energy and protein requirements.

Studies of breakfast consumption among different groups of South African school children have shown dissimilar results. Wolmarans *et al* [2] found that 86% of Sub A and 83% of Grade 5 urban black children did not have anything to eat or drink before school. Walker *et al* [2], in their study conducted among adolescents, found that 81% of urban black children ate breakfast. In a study conducted among 6-14 year-olds residing in Lebowa, Steyn, Badenhorst and Nel [32] found that more than 80% of these children consumed breakfast, but a complete nutritional survey among the same group indicated a high prevalence of malnutrition, contradicting other authors' [33] findings which showed that children who ate breakfast had better nutritional status than those who skipped it.

Consumption of breakfast was found to be higher among children in developed countries. In Spain, Ortega *et al* [1] found that only 3% of boys and 5% of girls aged 9-12 did not eat breakfast. In Canada, Mc Intyre *et al* [34] , in a survey conducted among 4079 children attending Grade 1 to Grade 3, reported that 6% of them did not have breakfast on the day of the study. In the United Kingdom, Box and Lundman [35] found that only 4.1% of 935 children aged 5-8 years missed breakfast. In a study conducted in London by Dickie and Bender [36] , they found that 14% of children omitted breakfast. Nichlas *et al* [37] found that 16% of children in New Orleans skipped breakfast.

Although the contribution that breakfast made towards children's nutritional well-being has been demonstrated, whether maximum growth and development in children could be associated with longevity and better health in later life has not yet been proven. Researchers[38-41] have stressed the necessity of gaining more knowledge about the minimum nutrient intake which would permit reasonable growth in children. They have also emphasised that although dietary recommendations from half a century ago were aimed towards maximising growth, those of the present are directed towards maximising longevity.

Breakfast habits as well as eating habits as a whole, constitute a learning process which starts developing at an early age [42] and are strongly influenced by the family and school peers[42,43] . A tendency towards deterioration of healthy breakfast eating habits with increasing age has been reported by various authors [9,44,45] , who explained it as a result of children becoming more rebellious against family rules as they get older.

Different models have been used to teach children healthy eating habits[46] . Among those models are the "social learning theory", the "dynamic systems theory" and the "play approach to learning" which is based on Piaget's theory of cognitive development [46] .The social learning

theory focuses on external manipulation of the environment and the individual to teach health behaviour. The dynamic systems theory which considers the individual, the task and the environment, focuses on the individual as the critical point to teach healthy behaviour, while in the play approach to learning, the individual interaction with the task and environment constitutes the basis of learning.

Summarising the findings in the literature about the importance of breakfast, it can be concluded that although its beneficial effect on school performance has not yet been fully demonstrated, there is some evidence to suggest that breakfast consumption has a positive effect in children's cognitive function, particularly among those children with sub-optimal nutritional status and its important contribution towards children's daily nutritional requirement has been demonstrated.

Chapter 3.

3.1Methodology

3.1.1 Study Design

A cross-sectional descriptive study using a random sample was conducted among children of different ages, sexes, and ethnic groups attending four urban schools in Johannesburg.

3.1.2 Population and Sampling

The population consisted of Grade 3 and Grade 7 children attending four Johannesburg primary schools. The mothers/guardians and the teachers were also asked to take part in the study. The schools were chosen on the grounds of their willingness to take part in this research. The children in these schools were of different ethnic groups.

The schools selected were as follows:

Greenside Primary School: This is a predominantly white and indian co-educational government school, located in the northern suburbs of Johannesburg, attended by middle-upper class children residing in the northern suburbs region as well as in Lenasia (West-Rand).

The Holy Family Convent: This is a predominantly black co-educational private convent, located in Parktown, attended by middle-upper class children residing in the area and also in Soweto.

Johannesburg Girls Preparatory School: This is a predominantly black government school, located in the suburb of Berea, attended by girls of lower socio-economic background living in Hillbrow, Berea and Soweto.

Yeoville Boys Preparatory School: This is a predominantly black government school, located in Yeoville, attended by boys of lower socio-economic background living in Hillbrow, Berea, Yeoville and Soweto.

Two different age groups were included in the study:
The Grade 3 group (previously Standard 1): It is the youngest age group in which concentration span and verbal communication skills were expected to be adequate for taking part in the interviews.
The Grade 7 group (previously Standard 5): It is the oldest age group in primary school.

The reason for including these two different age groups was to determine whether breakfast eating habits changed with increasing age.

A random sample of 262 children was selected: 90 Grade 3 children and 172 Grade 7 children. The sample size needed in each group for a 0.05 level of significance and a power of 90%, was 20 children. The Grade 3's sample size was smaller than that of the Grade 7's due to the interviews conducted among the younger group taking a considerable longer time to complete than did the questionnaires administered to the older group. The limited period of time allocated to the researcher by the schools for the collection of the data also played a role.

For each school taking part, the names of all its Grade 3's were placed in a container, and a sample proportional to the total number of Grade 3's was picked out. The same procedure was used to select the sample of Grade 7's. The total number of eligible students was 563: 313 Grade 3 children and 250 Grade 7 children.

Thus the sample of children consisted of:

(a) 90 Grade 3 children

(b) 172 Grade 7 children

A total of 17 teachers (the teachers in charge of the children selected): 9 Grade 3 teachers and 8 Grade 7 teachers and the children's mother/guardian were also asked to participate.

3.2 Pilot study

A pilot study was conducted among 30 children attending two urban schools in Johannesburg. Children of both sexes, age groups (Grade 3 and Grade 7) and different ethnic groups were included, as well as the relevant teachers and mothers/guardians. Certain questions in the questionnaires and interview were modified after the pilot study in order to make them more understandable to the respondents.

3.3 Data collection

3.3.1 Instruments

This section will describe the instruments used to collect the data among teachers, and both groups of children and their mothers/guardians.

3.3.1.1 Teachers

Information sheets were given to each class teacher to fill-in data regarding the children. Before the interviews were held and the questionnaires were administered, each class teacher received an envelope containing a sheet in which he/she was asked to answer five questions concerning each child. These questions were aimed at eliciting the following information: child's ethnic group and class position, days absent during the current year, particular problems that teachers may have noticed in the child, e.g. lack of concentration, restlessness, sleepiness, as well his/her overall impression of the child.

3.3.1.2 Grade 3

The researcher conducted personal structured interviews with the children during school hours. The children were initially addressed by the teacher who introduced the researcher to the group. The researcher explained the procedure of the interviews to the children, allowing them time to ask questions. The interviews, which were recorded in writing by the researcher, consisted of fifteen simple questions and lasted approximately twenty minutes. The first six questions were aimed at obtaining demographic data: age and sex, number of children in the family and how far the children's place of residences were from the school. These were factors expected to influence the pattern of breakfast consumption. Questions number seven to thirteen, dealt with frequency of breakfast consumption and different food and drinks consumed at breakfast.

Question numbers fourteen and fifteen intended to explore reasons why children liked or disliked breakfast and their thoughts about its importance. Due to the simplicity of the questions presented to the Grade 3s, comparability of data between both age groups was not always possible.

3.3.1.3 Grade 7

Self-administered questionnaires were used. The questionnaires were administered at school during school hours. They consisted of twenty-one questions and took approximately thirty minutes to complete. The researcher read the questions aloud in front of the class, allowing the children to clarify any doubts before answering each question. The questions presented to the older group were more elaborate. The first part of the questionnaire was aimed at obtaining demographic data, and to find out how children traveled to school (questions number one to six). From question number seven to twelve, children were asked about preparation of breakfast and different food and drinks consumed. The remainder of the questionnaire examine children's thoughts about the importance of breakfast, its relationship to health and school perfomance, the nutritional value of certain breakfast products and reasons for omission of breakfast. These aspects were explored in depth among the older group.

3.3.1.4 Mothers/guardians

Self- administered questionnaires were used. Children were asked to take home an envelope containing a questionnaire consisting of 21 questions to be answered by their mothers/guardians, which had to be returned to the class teacher. In order to be able to compare children's and their mothers'/guardians' knowledge, attitudes and perceptions regarding breakfast, most of the questions asked to the children, were also asked of their mothers/guardians. The first part of the questionnaire included questions regarding demographic data (guardians' relationship to the child, standard of education, occupation and time of leaving home in the morning). These were factors expected to influence breakfast consumption.

The remainder of the questionnaire included questions regarding frequency of breakfast consumption, different food and drinks consumed by children at breakfast, and mothers'/guardians' views of the importance and benefits of breakfast. The answers given to those questions were compared to the answers given by the children.

3.3.2 Administration

This section will describe how the teachers', mothers'/guardians' and Grade 7 children's questionnaires were administered and how the Grade 3 children's interviews were conducted.

3.3.2.1 Teachers

The teachers gave verbal consent to take part in this study. A week before the interviews were held and the questionnaires administered, each class teacher received an envelope containing a sheet in which she was asked to fill-in information regarding each child taking part in the study. The teacher was also asked to place the child's name in front of a numbered envelope using an adhesive label, which she had to detach before handing the envelope to each child on the day the conduction of the interviews and completion of questionnaires took place. This was done for the purpose of confidentiality and anonymity. Thereafter the researcher collected the envelopes from each child.

3.3.2.2 Grade 3

Parents/guardians were asked to give written consent for the Grade 3 children to take part in the study. Children gave verbal consent. The children received the teacher's envelope prior to the interviews. The teacher had previously detached the child's name from the envelope.

Each child was assigned a number. This number appeared on each form and envelope belonging to the child: the child's interview form, his/her mother's/guardian's questionnaire and the teacher's form. The researcher collected the teacher's envelope from the children and kept the child's interview form after the interview had taken place.

The researcher gave the child an envelope containing the mother's/guardian's questionnaire to take home. The child was instructed to put his/her envelope inside his/her suitcase immediately and not to swap it with another child.

3.3.2.3 Grade 7

Parents/guardians were asked to give written consent for their Grade 7 children to take part in the study while children gave verbal consent. Before answering the questionnaire, each child received the teacher's envelope, from which he/she had detached the child's name to maintain confidentiality. After the questionnaires were completed, the researcher collected the children's questionnaires and the teachers' envelopes and gave each child the mothers'/guardians' questionnaire to take home, instructing the children not to swap the envelopes. Each child was assigned a number. This number appeared on each form and envelope belonging to the child: the child's questionnaire, his/her mother's/guardian's questionnaire and the teacher's form.

3.3.2.4 Mothers/Guardians

Letters were sent to all mothers/guardians of the children selected. The consent form had to be detached from the letter. The purpose of the study and the intention of sending a questionnaire to them was expressed in the letter. The freedom to choose not to answer the

questionnaire or not to allow the children to take part in the study, as well as the fact that the information was anonymous and confidential and would not influence the children's school marks was emphasised. After the interviews and questionnaires had been completed, each child received an envelope containing the mothers'/guardians' questionnaire to take home. Each questionnaire form and each envelope was marked with the child's number. The mothers/guardians were asked to answer the questionnaire and return it to school with the child, who would hand it to his/her class teacher. The researcher collected the questionnaires from the teachers a week later.

At the end of the study, the researcher was expected to have three envelopes for each child taking part in the study i.e. the child's interview/questionnaire, the mother's/guardian's questionnaire and the teacher's information sheet. Each envelope and interview/questionnaire form belonging to the same child was marked with the same number.

3.4 Ethical issues.

Approval for this study was obtained from the University of the Witwatersrand's Committee for Research on Human Subjects.

Consent to do the research was obtained from the schools' principals after consultation with the Schools' Governing Bodies. The parents were informed that the questionnaires and interviews were based on simple questions regarding breakfast.

The fact that the results were anonymous, confidential and would not influence the children's schoolwork or marks was emphasised. The parents were assured of their freedom to object to their child's or their own participation in the study if they wished.

Each parent received a consent form, which was signed and returned to the class teacher. Teachers and children gave verbal consent to take part in the study. The fact that the participation in the study would not influence school marks in any way was also explained to the children.

3.5 Methods of data analysis

The data obtained from this study was processed and analyzed by computer using the Epi-Info Program version 6.2, CDC Statistical analysis was done in consultation with a Medical Research Council statistician.

In order to describe the data, frequencies and percentages were calculated for categorical variables and means and standard deviations for continuous variables. In order to obtain differences between groups, Chi-Square Test was mostly used for categorical variables and Fisher's Exact Test was used when appropriate. The Student's T Test was used for matched pairs with parametric data and the Mann-Whitney Test was used for two independent groups with non-parametric data. Answers given by mothers/guardians and children were compared using the McNemar Test of Symmetry.

3.6 LIMITATIONS OF RESEARCH.

The following limitations were taken into consideration:

Language: All questionnaires and interviews were done in English; other home languages

could not be accommodated. To avoid misinterpretations, the questions were formulated using simple English language.

Socio-economic groups: Due to the fact that the researcher is employed in an urban hospital, lack of time prevented her from selecting schools located in townships and rural areas. Although children of different socio-economic and ethnic groups were included in the study, those children were all attending urban schools. The study lacked relevant information regarding children of lower socio-economic groups attending schools located in townships and rural areas.

Comparability of data between Grade 3 and Grade 7: Due to the simplicity of the questions presented to the younger children, comparability of data between both groups as well as between the younger children and their mothers/guardians was not always possible.

Validity of information: Older children and mothers could have given false information in order to comply with expected attitudes and behaviour. To minimise this problem, they were assured that all the information would be anonymous and confidential and would not influence the children's school marks.

Anthropometric assessment and psychometric evaluation of school performance: The inclusion of this data was beyond the scope of the study.

Chapter 4.

RESULTS

4.1 Response Rate.

The theoretical sample and the response rate among children, mothers/guardians and teachers is shown in **Table 1.**

Table 1.Response rate among children, mothers/guardians and teachers.

	THEORETICAL SAMPLE		ACTUAL RESPONSE RATE					
	Theoretical sample (n = 262)		Children (n = 217)		Mothers/guardians (n = 180)		Teachers information sheets (n = 217)	
	f	%	f	%	f	%	f	%
Grade 3	90	100	73	81.1	52	57.7	73	100
Grade 7	172	100	144	79.1	128	74.4	144	100
TOTAL	**62**	**100**	**217**	**82.8**	**180**	**68.7**	**217**	**100**

The theoretical sample consisted of 262 children: 90 Grade 3 children and 172 Grade 7 children. Their mothers/guardians and 17 class teachers were also included in the study.

The interviews were conducted among 73 out of 90 Grade 3 children (81.1%), while 144 out of 172 Grade7 children (79.1%) answered the questionnaires. Although all the children selected had parental consent to take part, 45 children (17 Grade 3s and 28 Grade 7s) were absent from school on the day that the study was conducted. Among the mothers/guardians, 180 out of 217 (68%) answered the questionnaires: 52 out of 73 Grade 3s mothers (57.7%) and 128 out of 144 Grade 7s mothers (74.4%). Although no repeat questionnaires were sent to the mothers/guardians, on various occasions the teachers asked the children to remain their mothers about the questionnaires, without an improvement on the response rate. The

teachers completed an information sheet per child selected, but those belonging to children who were absent on the day the study was conducted, were not included.

A comparison of the response rate among all the children, their mothers/guardians and their teachers is shown in **Figure 1.**

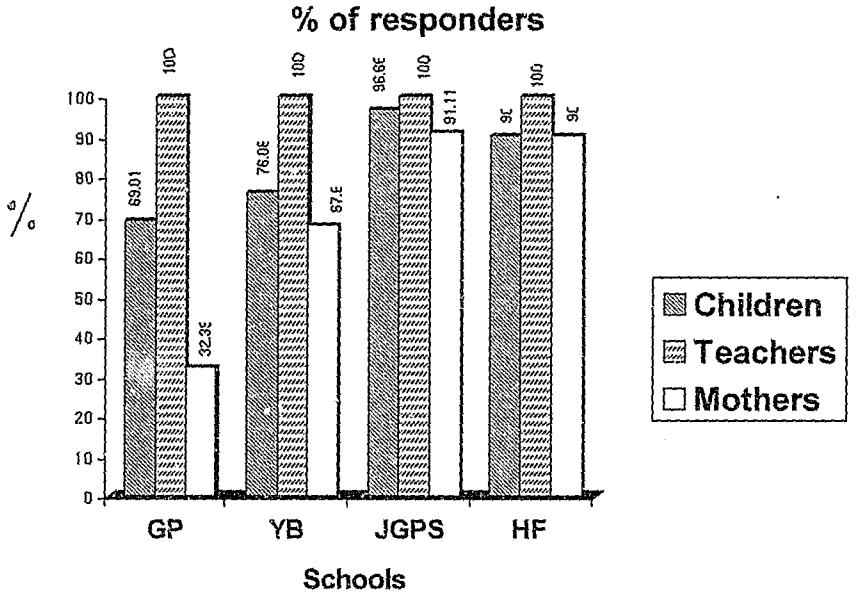

Figure 1. Response rate in the four schools.

It was observed that the teachers' response rate was 100% in all the schools. The lowest response rate among children and mothers/guardians was found at Greenside Primary: 69% and 32.3% respectively. The school with the highest response rate was Johannesburg Girls: 96.6% among children and 91.1% among mothers/guardians.

The response rate among both groups of children, their mothers/guardians and the teachers in each of the schools is shown in **Table 2.**

Table 2. Comparison of response rate between Grade 3 and Grade 7 children, mothers/guardians and teachers in the four schools

G.P. School	Theoretical sample (n=90)		Children (n=90)		Mothers/ Guardians (n=90)		Teachers Inf. Sheets (n=90)	
	f	%	f	%	f	%	f	%
Grade 3	20	100	14	70	0	0	16	100
Grade 7	51	100	35	68.82	23	45.09	35	100
TOTAL	**71**	**100**	**49**	**69.01**	**23**	**32.39**	**51**	**100**

Y.B. School	Theoretical sample (n=71)		Children (n=71)		Mothers/ Guardians (n=71)		Teachers Inf. Sheets (n=71)	
	f	%	f	%	f	%	f	%
Grade 3	30	100	24	80	18	60	24	100
Grade 7	41	100	30	73.1	30	73.1	30	100
TOTAL	**71**	**100**	**54**	**76**	**48**	**67.6**	**54**	**100**

J.G.P.S. School	Theoretical sample (n=90)		Children (n=90)		Mothers/ Guardians (n=90)		Teachers Inf. Sheets (n=90)	
	f	%	f	%	f	%	f	%
Grade 3	32	100	30	93.7	29	90.6	30	100
Grade 7	58	100	57	98.2	53	91.3	57	100
TOTAL	**90**	**100**	**87**	**96.6**	**82**	**91.1**	**87**	**100**

H.F. School	Theoretical sample (n=30)		Children (n=30)		Mothers/ Guardians (n=30)		Teachers Inf. Sheets (n=30)	
	f	%	f	%	f	%	f	%
Grade 3	8	100	5	62.5	5	100	5	100
Grade 7	22	100	22	100	22	100	22	100
TOTAL	**30**	**100**	**27**	**90**	**27**	**90**	**27**	**100**

When comparing the response rate of both groups of children and their mothers/guardians in each of the schools, it was observed that, for unknown reasons, Holy Family had the lowest response rate among Grade 3s (62.5%), while Greenside Primary had the lowest response rate among Grade 7s (68.8%) as well as among both groups of mothers/guardians: only 45% of Grade 7s mothers/guardians and none of the Grade 3s mothers/guardians returned the

questionnaires. The school which had the highest response rate was Johannesburg Girls: 96.6% among children (93.7% among Grade 3s and 98.2% among Grade 7s), and 91.1% among mothers/guardians (90.6% among Grade 3s mothers/guardians and 91.3% among Grade 7s mothers/guardians). **Table 3** shows the number of children in the four schools who took part in the study.

Table 3. Number of children taking part in each school.

Grade	Schools											
	J.G.P.S.			H.F.			Y.B.			G.P		
	n	f	%	n	f	%	n	f	%	n	f	%
3 (n=73)	124	30	41	21	5	6.8	92	24	33	66	14	19
7 (n=144)	86	57	39.6	30	22	15.2	60	30	21	74	35	24.3
Total (n=217)	210	87	40	51	27	12.4	152	54	25	140	49	22.5

n = Total number of children in each class in the four schools.

4.2 Demographic Data.

4.2.1Children

4.2.1.1 Age and Sex

The age distribution of the Grade 3 and Grade 7 children is shown in **Table 4.**

Table 4. Age distribution.

GRADE 3			GRADE 7		
Age (in years)	Children (n=73)		Age (in years)	Children (n=144)	
	f	%		f	%
8	10	13.7	12	30	20.8
9	50	68.5	13	72	50
10	13	17.8	14	38	26.4
			15	3	2.1
			16	1	0.7
Total	**73**	**100**	**Total**	**144**	**100**

The sex distribution of both groups of children is shown in **Table 5.**

Table 5. Sex distribution.

Sex distribution	TOTAL (n = 217)		GRADE 3 (n = 73)		GRADE 7 (n = 144)	
	f	%	f	%	f	%
Boys	83	38.2	34	46.5	49	34
Girls	134	62.2	39	53.4	95	66
Total	**217**	**100**	**73**	**100**	**144**	**100**

Although the mean ages were found to be 9 years for Grade 3 children and 13 years for Grade 7 children, an important percentage of children were older: 17.8% of Grade 3s were 10 years old and 26.4% of Grade 7s were 14 years and older. The majority of responders were girls (62.2%) : 53.4% among Grade 3s and 66% among Grade 7s.

4.2.1.2 Ethnicity.

The class teachers were asked to state the pupils' ethnicity. This question which was asked with the purpose of establishing differences regarding breakfast consumption among children of various ethnic groups, was not asked to the parents or to the children to avoid misinterpretations regarding racial discrimination. The ethnic distribution of children is shown in **Table 6.**

Table 6. Ethnic Distribution.

Ethnic Group	Children	
	f	%
Black	147	74.2
Indian	22	11.1
Coloured	14	7.1
White	13	6.6
Other	2	1
Total	**198**	**91.2**

The majority of children taking part in the study were black (74.2%). No statistically significant differences in ethnic distribution were found among children attending the four schools.

4.2.1.3 Number of children in the family.

Pupils were asked about the number of childrens in their families. It was expected that due to socio-economic factors, larger families would negatively influence children's breakfast consumption. The differences in number of children in the family among both groups are shown in **Table 7.**

Table 7. Children's siblings: comparison between both groups.

No. of children	Grade 3 (n= 73)			Grade 7 (n = 144)		
	f	%	Cum %	f	%	Cum %
0	5	6.8	6.9	16	11.1	1.1
1	23	31.5	38.4	59	41	52.1
2	24	33.0	71.2	38	26.4	78.5
3	9	12.3	83.6	21	14.6	93.1
4	4	5.5	89	7	4.8	97.9
5	3	4.1	93.2	2	1.4	99.3
6	2	2.7	95.9	0	0	0
7	2	2.7	98.6	1	0.7	100
8	1	1.4	100	0	0	0
TOTAL	73	100		144	100	

Larger families were found among children in Grade 3 where 33% of the pupils had 2 siblings (3 children in the family) compared to 26.4% among Grade 7s. A larger number of Grade 7s (41%), than Grade 3s (31.5%), had only one sibling (2 children in the family). These differences were not statistically significant.

4.2.1.4 Children's residential area.

Children were asked to name their area of residence. It was expected that due to lack of time, children who lived further away from school would be prone to omit breakfast. For practical reasons the different residential areas were grouped into six regions. Residential areas which were close to one another were grouped under the same region. The different

residential areas of children are shown in **Table 8.**

Table 8. Residential areas

Name	Areas included
West-Rand	Soweto, Chiawelo, Pimville, Mofolo, Mepella, Nolapo, Protea North, Klipspruit, Meadowlands, Dobsonville, Orlando, Naturena, Eldorado Park Riverlea Extension, Lenasia
Northern Suburbs	Windsor, Norwood, Killarney, Florida, Linden, Greenside, Emmarentia, Parkhurst, Victory Park, Parkview, Melville, Oakdene, Bryanston, Parktown, Northcliff, Bedfordview.
Central Johannesburg	City Centre, Berea, Yeoville, Hillbrow, Bellevue, Bertrams, Mayfair, Brixton, Auckland Park
South	Robertsham, Mondeor, South Gate
Alexandra	Alexandra township
East-Rand	Germiston, Leondale, Katlehong, Vosloorus, Tembisa

The different residential areas of both groups of children are shown in **Table 9.**

Table 9.Residential areas of both groups of children.

Suburb	Total (n=217)		Grade 3 (n=73)		Grade 7 (n=144)	
	f	%	f	%	f	%
West Rand	97	44.7	34	46.5	62	43
Northern Suburbs	40	18.4	10	13.6	30	21
Central Johannesburg	54	24.8	24	30.5	30	21
South	4	1.8	1	1.4	3	2.1
Alexandra	11	5	0	0	11	7.6
East Rand	10	4.6	4	7	6	4.8
Total	**216**	**100**	**73**	**100**	**144**	**100**

It was observed that 44.7% of the children resided in the West Rand: 45.2% of Grade 3s and 43% of Grade 7s. Differences in residential areas were found among children attending the four schools. These differences are shown in **Table 10.**

Table 10. Comparison of residential areas of children of both age groups attending the different schools.

Suburb	JGPS				HF				YB				GP			
	G3 (n=30)		G7 (n=57)		G3 (n=5)		G7 (n=22)		G3 (n=24)		G7 (n=30)		G3 (n=14)		G7 (n=35)	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
West- Rand	15	50	29	50.8	5	100	14	63.6	10	41.6	18	60	4	28.5	11	31.4
Northern suburbs	1	3.3	3	5.2	0	0	4	18.1	1	4.1	0	0	7	50	18	51.4
Central Johannesburg	11	36.6	18	31.5	0	0	2	9.9	13	54.1	10	33.3	2	14.2	4	11.4
East- Rand	1	3.3	3	5.2	0	0	0	0	0	0	0	0	0	0	1	2.8
South	2	6.6	2	3.5			1	4.5			0	0	1	7.1	1	2.8
Alexandra	0	0	2	3.5	0	0	1	4.5	0	0	2	6.6	0	0	0	0
Total	30	100	57	100	5	100	22	100	24	100	30	100	14	100	35	100

At Johannesburg Girls, 50% of Grade 3s and 50.8% of Grade 7s resided in the West-Rand. At Holy Family 100% of Grade 3s and 63.3% of Grade 7s and at Yeoville Boys 41.6% of Grade 3s and 60% of Grade 7s also resided in the West-Rand while at Greenside Primary, 50% of Grade 3s and 51.4% of Grade 7s resided in the Northern Suburbs.

4.2.1.5 Means of arriving at school

The different means of arriving at school of both groups of children are shown in **Table 11.**

Table 11. Children's means of arriving at school.

Means of arriving	Total (n=217)		Grade 3 (n=73)		Grade 7 (n=144)	
	f	%	f	%	f	%
Walk short distance	30	13.8	11	15	19	13.1
Walk a long distance	8	3.7	4	5.4	4	2.7
Travel by car/bus	120	55.2	29	39.7	91	65
Travel by combi	59	27.1	29	39.7	30	20.8
Total	**217**	**100**	**73**	**100**	**144**	**100**

It was observed that 55.2% of children travelled to school by car/bus: 39.7% of the Grade 3s and 65% of the Grade 7s. A small percentage of children walked either a "short distance" (less than five blocks) (13.8%) or a long distance (more than five blocks) (3.7%). These

differences were not statistically significant. A comparison of different means of travelling to school among both groups of children attending the four schools is shown in **Table 12**

Table 12. Comparison of means of traveling to school among children attending the different schools.

Means of travelling	JGPS				HF				YB				GP			
	G3		G7		G3		G7		G3		G7		G3		G7	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Walk a short distance	8	26.6	10	17.5	0	0	1	4.5	1	4.1	4	13.3	2	14.2	4	11.4
Walk a long distance	1	3.3	1	1.5	0	0	0	0	3	12.5	3	10	0	0	0	0
Travelled by Car/bus	6	20	35	60.4	2	40	18	81.8	11	45.8	16	50	10	71.4	25	71.4
Travelled by Combi	15	50	12	21	3	60	3	13.6	9	37.5	8	26.6	2	14.2	7	20
Total	**30**	**100**	**58**	**100**	**5**	**100**	**22**	**100**	**24**	**100**	**31**	**100**	**14**	**100**	**36**	**100**

Johannesburg Girls had the largest group of children who "walked a short distance" (less than 5 blocks): 26.6% of Grade 3s. Holy Family and Greenside were the schools in which none of the children "walked a long distance" (more than 5 blocks). In Johannesburg Girls and Holy Family a large percentage of Grade 3s travelled by combi (50% and 60% respectively) while a large percentage of Grade 7s travelled by car/bus (60.4% and 81.8% respectively). In Yeoville Boys and Greenside Primary, 45.8% of Grade 3s and 50% of the grade 7s, and 71.4% of Grade 3s and Grade 7s respectively travelled by car/bus.

4.2.2 Mothers/Guardians

The majority of respondents (89.8%) were the children's mothers; the remaining 10.2% were other relatives. *These findings are shown* in **Table 13.**

Table 13. Guardians' relationship to the children

Relationship to the children	Responders f	%
Father	1	0.6
Brother	1	0.6
Sister	3	1.9
Grandmother	7	4.3
Aunt	5	3.1
Stepmother	1	0.6
Total	**18**	**10.2**

4.2.2.1 Level of schooling

The level of schooling and highest education obtained by mothers/guardians are shown in **Table 14.**

Table 14. Mothers'/guardians' level of schooling

Level of schooling	Mothers/guardians (n = 180) f	%	Cum %
Grade 1	2	1.3	1.3
Grade 4	1	0.6	1.9
Grade 7	2	1.3	3.2
Grade 8	4	2.6	5.8
Grade 9	1	0.6	6.4
Grade 10	14	9.0	15.4
Grade 11	16	10.3	25.6
Grade 12	116	74.4	100
TOTAL	**156**	**86.6**	

It was observed that the majority of mothers/guardians (74.4%) completed Grade12 (Matric) and a very low percentage (1.3%) only completed Grade 7 (Primary School); 56.4% of them completed further studies as shown in **Table 15.**

Table 15. Mothers'/Guardians' further education

Further education	Mothers/Guardians (n = 180) f	%	cum %
College/Technikon	52	28.8	28.8
University	28	15.5	44.3
Not specified	3	1.6	45.9
Other	19	10.5	56.4
TOTAL	**102**	**56.4**	

.A high percentage of mothers/guardians (28.8%) obtained a College or Technikon degree and 15.5% completed University. A total of 19 mothers/guardians (10.5%) completed other studies as follows: banking (1), nursing course (7), beautician (3), communications (1), managerial (1), various diplomas (1), dress-making (1), paramedic (1), computer course (1), hospital related course (1) and business course (1). No statistically significant difference in level of education was found among mothers/guardians of children attending the four schools.

4.2.2.2 Occupation

For practical purposes, mothers'/guardians' occupations were grouped under 9 categories. The different occupations of mothers/guardians are shown in **Table 16**. No statistically significant differences in occupation were found among mothers/guardians of children attending the four schools.

Table 16. Mothers'/Guardians' occupation

Occupation	Mothers/guardians (n=180)		
	f	%	Cum %
Managerial/business	60	33.3	33.3
Professional	58	32.2	65.5
Trade	15	8.3	73.8
Manual work	6	3.3	77.1
Students	2	1.1	78.2
Not specified	7	3.8	82
Unemployed	18	10	92
Not answered	10	5.5	97.5
Other	4	2.2	100
Total	**180**	**100**	

It was observed that 33.3% of mothers/guardians were either involved in managerial/business work and 32.2% were professionals. Among the last group, 14 (7.8%) were teachers and 44 (23.9%) were involved in medical related work. It was found that 32 mothers/guardians (17.8%), were in the nursing profession.

4.2.2.3 Time working mothers/guardians leave home.

Mothers/guardians were asked the time they usually left home for work.

This information is shown in **Table 17**.

Table 17. Time that working mothers/guardians left home

Time (h)	Mothers/Guardians (n = 180)		
	f	%	Cum %
05:00	8	5.3	5.3
06:00	43	28.7	34.0
07:00	73	48.7	82.7
08:00	17	11.3	94.0
09:00	3	2.0	96.0
10:00	1	0.7	96.7
12:00	1	0.7	97.3
18:00	4	2.7	100
Total	**150**	**83.3**	

It was observed that 48.7% of mothers/guardians left home for work at 07:00h and 34% of them left home before 06:00h.

4.3 Children's breakfast eating habits and their attitudes and awareness regarding breakfast.

4.3.1 Comparison of frequency of breakfast consumption.

Grade 3 children were asked whether they had breakfast daily (question No.7), or if there were some days when they ate breakfast (question No. 10) They were not asked about different patterns of breakfast consumption. Grade 7 children were asked to select from 7 categories how often they had breakfast (*question* No. 8). These findings are shown in **Table 18.**

Table 18. Frequency of breakfast consumption among both groups of children.

Frequency	Grade 7 (n=144)			Grade 3 (*n*=73)		
	f	%	cum%	f	%	cum %
Daily	74	51.4	51.4	48	65.7	65.7
Week days	12	8.3	59.4	-	-	-
Week ends	5	3.5	63.2	-	-	-
School days	2	1.4	64.6	-	-	-
Very seldom	34	23.6	88.2	-	-	-
Never	2	1.4	89.6	0	0	0
No fixed pattern	15	10.4	100	25	34.2	100
Total	**144**	**100**		**73**	**100**	

It was observed that 65.7% of Grade 3 children had breakfast daily; although none of them reported "never " eating breakfast, 34.2% had no fixed pattern of breakfast co... ...tion. Among the Grade 7s, it was observed that 51.4% had breakfast daily. While only 1.4% of

them admitted "never" eating breakfast, a high percentage (23.6%) ate breakfast "very seldom".

Differences in daily breakfast consumption between children of both sexes and age groups are shown in **Table 19.**

Table 19. Daily breakfast consumption: differences between children of both sexes and age groups.

Daily breakfast		
	f	%
Girls	44	58.2
Boys	79	54.2
Grade 3s	48	65.7
Grade 7s	75	51.4

When comparing differences in breakfast consumption between children of both sexes as a whole, it was observed that a larger percentage of girls (58.2%) than boys (54.2%) had breakfast daily. When comparing findings regarding breakfast consumption between children of both age groups, it was observed that more Grade 3s (65.7%) than Grade 7s (51.4%) consumed breakfast daily. These differences were not statistically significant.

A comparison of daily breakfast consumption between children of both sexes and age groups is shown in **Figure 2.**

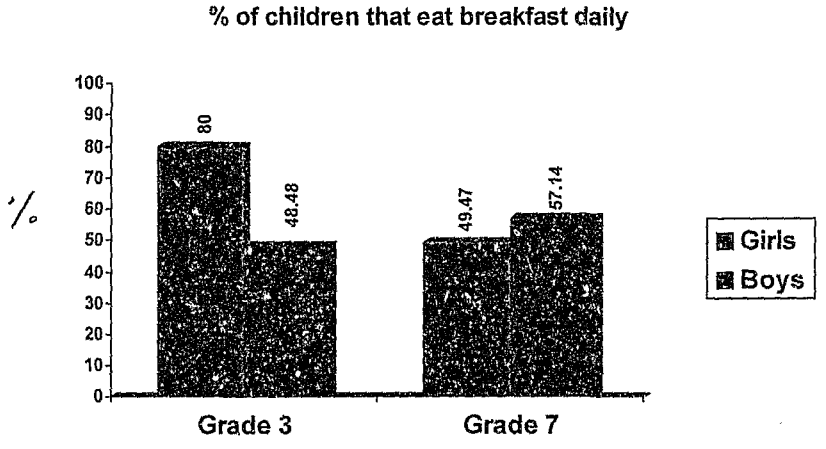

Figure 2. Comparison of daily breakfast consumption between children of both sexes and age groups.

A statistically significant difference in daily breakfast consumption between boys and girls in Grade 3was found : 80% of Grade 3 girls consumed breakfast daily compared to 48.5% of Grade 3 boys (p 0.006). It was also observed that daily breakfast consumption decreased from 80% among Grade 3 girls to 49.5% among Grade 7 girls (p 0.003), while a slight improvement was seen when comparing both groups of boys: from 48.5% of Grade 3 boys consumed breakfast daily compared to 57.1% of Grade 7 boys.

Differences in daily breakfast consumption were observed among both groups of children attending the four schools. These findings are shown in **Table 20.**

Table 20. Daily breakfast consumption: differences among children attending the four schools.

Grade	Children who consumed breakfast daily							
	J.G.P.S.		H.F.		Y.B.		G.P.	
	f	%	f	%	f	%	f	%
3	23(n=30)	76.7	4(n=5)	80	11(n=24)	45.8	10(n=14)	71.4
7	20(n=57)	35	12(n=22)	54.5	18(n=30)	60	24(n=35)	68.5
Total	**43(n=87)**	**49.4**	**16(n=27)**	**59.2**	**29(n=54)**	**53.7**	**34(n=49)**	**69.3**

The school which had the largest total percentage of children (69.3) as well as the largest percentage of Grade 7s (68.5) who consumed breakfast was Grennside Primary. The highest percentage of Grade 3 children who consumed breakfast daily was found at Holy Family (80%). J.G.P.S. and Y.B. had the lowest percentage of Grade7s (35%) and Grade 3s (45.8%) respectively who consumed breakfast daily.

4.3.2 Children's breakfast consumption in relation to distance to school.

The distance that Grade 3 children travelled to school was compared to whether they had breakfast daily or not. Due to the fact that only 2 Grade 7 children "never" ate breakfast (Table 18) the comparison was made between Grade 7s who ate breakfast either daily or very seldom. These findings, which are not statistically significant, are shown in **Table 21.**

Table 21. Children's breakfast consumption in relation to distance to school.

DISTANCE	Grade 3 (n=73) Breakfast				GRADE 7 (n=144) Breakfast			
	Daily		Non-daily		Daily		Seldom	
	f	%	f	%	f	%	f	%
walk short dist.	8	72.7	3	27.2	9	12.1	5	14.7
Walk long dist.	2	50	2	50	2	2.7	0	0
Car/bus	14	48.2	15	51.7	47	63.5	23	67.6
combi	24	82.7	5	17.2	16	21.6	6	17.6
Total	**48**	**100**	**25**	**100**	**74**	**100**	**34**	**100**
p value	**0.33**				**0.98**			

4.3.3 Children's breakfast consumption in relation to area of residence.

The relationship between children's area of residence and their frequencies of breakfast consumption among both groups of children is shown in **Table 22.** These differences were not statistically significant.

Table 22. Children's breakfast consumption in relation to their area of residence.

	Grade 3 (n=73) Breakfast				Grade 7 (n=144) Breakfast			
	Daily		Non-daily		Daily		Seldom	
	f	%	f	%	f	%	f	%
West Rand	27	79.4	7	20.5	28	45.1	34	54.8
Northern suburbs	5	50	5	50	18	60	12	40
Central Johannesburg	14	58.3	10	41.4	17	56.6	13	43.3
South	0	0	1	100	2	66.6	1	33.3
Alexandra	0	0	0	0	7	63.6	4	36.3
East Rand	3	75	1	25	2	33.3	4	66.6
Total	**48**		**25**		**74**		**68**	
p value	**0.32**				**0.24**			

4.3.4 Children's breakfast consumption in relation to the time mothers/guardians left home for work.

The time that mothers/guardians left home for work, was compared to the frequency of breakfast consumption among both groups of children. The findings, which are not statistically significant, are shown in **Table 23.**

Table 23. Children's breakfast consumption in relation to the time mothers leave home.

Time (h)	Dly breakfast f	%	Non-daily breakfast f	%
Before 07:00	30	20.9	17	11.8
At 07:00	52	36.3	18	12.5
After 07:00	18	12.5	8	5.59
Total	***100***		**43**	

p value 0.48

4.3.5 Children's breakfast consumption in relation to the number of children in the family.

The number of children in the family was compared to the frequency of breakfast consumption among the total of Grade 3 and Grade 7 children. No statistically significant differences were found in their frequencies of breakfast consumption in relation to the number of children in their families. Those findings are shown in **Table 24.**

Table 24. Children's breakfast consumption in relation to the number of children in the family.

Variable		Grade 3 (n=73) Breakfast		Grade 7 (n=144) Breakfast	
		Daily	Non-Daily	Daily	Seldom
	Mean	2.9	3.7	2.6	2.4
No of children in the family	Sd	1.5	1.9	1.1	0.7
	n	48	25	74	34
	p value	0.075		0.18	

Due to the fact that only 2 Grade 7 children "never" had breakfast, the comparison was made between children who had breakfast daily and those who had breakfast seldom.

4.3.6 Children's attitudes and awareness regarding breakfast.

Grade 3 children were asked in an open-ended question whether they liked breakfast and their reasons (question No. 14). Although it was expected that it would be difficult for them to answer negatively, the reasons they gave were grouped under 4 different categories and are shown in **Table 25**.

Table 25. Reasons why Grade 3 children liked breakfast.

Reasons	Grade 3 children (n = 73) f	%
It made them healthy	26	35.6
It prevented them from getting hungry	18	24.6
It helped concentration	16	21.9
They liked it	13	17.8
TOTAL	**73**	**100**

The most common reasons why Grade 3 children liked eating breakfast were that "it made them healthy" (35.6%) and "it prevented them from getting hungry" (24.6%). Despite the

young age of the group, children gave the following statements about breakfast: "I can concentrate when I eat breakfast", "I can think properly", "I don't feel sleepy" and "Breakfast helps me to think". No statistically significant differences were found in the category of reasons given by children of both sexes.

Grade 7 children were asked to select from 7 categories different reasons why they ate breakfast (question No.13). They could choose more than one category. The group of children who ate breakfast either "very seldom " (34 children) or "never" (2 children), also answered this question . These reasons are shown in **Table 26**.

Table 26.Reasons for breakfast consumption given by Grade 7 children of both sexes.

REASONS	Total (n=144)		Boys (n=49)		Girls (n=95)	
	f	%	f	%	f	%
They were hungry	92	65.2	34	73.9	58	61
Their mother insisted	61	43.6	18	39.1	43	45.7
The rest of the family had breakfast	36	25.5	16	34.7	20	21
They liked it*	104	74.8	40	88.8	64	68
They thought it was good for them	101	72.1	30	65.2	71	75.5
Don't know	8	21.1	2	33.3	6	18.7
Other	12	37.5	4	8.1	8	25.8
TOTAL	**414**		**144**		**270**	

* p 0.011

The 144 children (49 boys and 95 girls), provided 414 answers (144 answers from the boys and 270 from the girls). The most common reason for breakfast consumption given by Grade 7 children of both sexes was that "they like it" (74.8%). A statistically significantly larger number of boys (88.8%) than girls (68%) selected this answer (p 0.011); the most common reason given by Grade 7 girls was that "they thought breakfast was good for them" (75.5%).

Although this question was leading and the answer was expected, Grade 3 children were asked whether they thought *breakfast was important and to motivate their answers* (question No.15). The majority of Grade 3s (94.5%) agreed that breakfast was important; the reasons why they thought it was important coincided with the reasons why they liked it: 25.8% thought "breakfast made them healthy", 24.1% thought "it helped with concentration" and 17.7% thought "it prevented them from getting hungry". No statistically significant differences were found in the answers given by children of both sexes.

Grade 7 children were asked to use a four-point scale to rate how important they thought breakfast was for them (question No.16). They rated it either as "very important" (52.1%), "important" (25.7%) or of "average importance" (18.1%). Only 4.1% of Grade 7 children thought breakfast "*was not important at all*". No statistically significant differences were found in answers given by children of both sexes.

They were also asked whether they thought breakfast helped them to keep healthy and whether it was good for them (question No. 17 and 18): 83.3% and 98.6% of Grade 7 children respectively answered affirmatively. No significant differences were found in answers given by children of both sexes attending the four schools.

Grade 7 children who thought "breakfast was good for them" were asked to select from 7 categories different reasons to motivate their answer. They were allowed to select more than one reason. These findings are shown in **Table 27**.

Table 27. Reasons why Grade 7 children of both sexes thought breakfast was good for them.

REASONS	Total (n=144)		Boys (n=49)		Girls (n=95)	
	f	%	f	%	f	%
It improves school work	62	43	29	59.1	33	34.7
It makes children better nourished	122	84.7	41	83.6	81	85.2
It improves sports perfomance	112	77.7	36	73.4	76	80
It makes children more friendly *	32	22.2	18	36.7	14	14.7
It improves health	136	94.4	45	91.8	91	95.7
It improves behaviour	35	24.3	16	32.6	19	20
Other	7	4.8	2	4	5	5.2
TOTAL	**506**		**187**		**319**	

* p =0.003

It was observed that 144 children provided 506 reasons why they thought breakfast was good for them: 49 boys gave 187 reasons and 95 girls gave 319 reasons.

The majority of Grade 7 children (94.4%) thought "breakfast improves health" (91.8% of boys and 95.7% of girls); 84.7% of them thought "breakfast makes children better nourished" (83.6% of boys and 85.2% of girls). A small percentage of Grade 7s (22.2%) thought "breakfast makes children more friendly"; a larger number of boys (36.7%) than girls (22.2%) selected this answer (p 0.003).

4.3.7 Breakfast food and drinks most frequently consumed by children.

Grade 7 children were asked to list the food and drinks they usually consumed at breakfast on schooldays and on weekends and school holidays (question No 11 and 12). Grade 3 children were asked to mention the food and drinks they usually consumed at breakfast without establishing differences in consumption between weekdays and weekends and school holidays. (question No 8, 11 and 13).

The different products consumed by Grade 7 children on weekdays and on weekends and school holidays are shown in **Table 28.**

Table 28. Products consumed by Grade 7 children on weekdays and on weekends and school holidays .

Product	Weekdays						Weekends and holidays					
	Total (n=144)		Boys (n=49)		Girls (n=95)		Total (n=144)		Boys (n=49)		Girls (n=95)	
	f	%	f	%	f	%	f	%	f	%	f	%
Porridge	105	72.9	32	65.3	73	76.8	62	43.1	18	6.7	44	46.3
Bread*	64	44.4	18	36.7	46	48.4	98	68.1	27	55.1*	71	74.7*
Juice**	63	43.7	18	36.7	45	47.3	68	47.2	14	28.7**	54	56.8**
Eggs	13	9	3	6.1	10	10.5	53	36.8	16	32.6	37	38.9
Meat	4	2.7	1	2	3	3.1	28	19.4	8	16.3	20	21
Tea	42	29.1	16	32.6	26	27.3	48	33.3	16	32.6	32	33.6
Coffee	32	22.2	10	20.4	22	23.1	31	21.5	8	16.3	23	24.2
Milk	36	25	8	16.3	28	29.4	27	18.7	8	16.3	19	20
Water***	16	11.1	0	0***	16	16.8***	10	6.9	1	2	9	9.4

* p=0.017 ** p=0.001 ***p=0.002

It was found that the food most frequently consumed by Grade 7s on weekdays was porridge (72.9%) followed by bread (44.4%). On weekends and school holidays porridge consumption decreased to 43.1% while bread consumption increased to 68.1%. These differences were not statistically significant. A statistically significant difference in consumption of bread was found between children of both sexes on weekends and school holidays: a larger percentage of girls (74.7%) than boys (55.1%) consumed bread on weekends and school holidays (p 0.017).

The drink most frequently consumed by Grade 7s on weekdays, as well as on weekends and school holidays was juice (43.7% and 47.2% respectively). A statistically significant difference in consumption of juice on weekends and school holidays was found between

Grade 7 children of both sexes: a larger percentage of girls (56.8%) than boys (28.7%) consumed juice on those periods (p 0.001).

Other products such as eggs and meat were found to be consumed by fewer children. Their consumption increased when comparing school days to weekends and school holidays: 9% of Grade 7s ate eggs on weekdays compared to 36.8% on weekends and school holidays and 2.7% of them ate meat on weekdays compared to 19.4% on weekends and school holidays. These differences were not statistically significant.

Tea, coffee, milk and water were also found to be consumed by a small percentage of Grade 7s. The difference in consumption of these products on weekdays and weekends and school holidays was not statistically significant. Tea was consumed by 29.1% of Grade 7s on weekdays and by 33.3% on weekends and school holidays; coffee was consumed by 22.2% of Grade 7s on weekdays and by 21.5% on weekends and school holidays. Milk consumption was found to be low: 25% of Grade 7s drank milk on weekdays and its consumption decreased on weekends and school holidays when only 18.7% of Grade 7 children were found to drink milk. The same applied to consumption of water, which decreased from 11.1% on weekdays to 6.9% on weekends and school holidays. A statistically significant difference in water consumption on weekdays was found between children of both sexes: 16.8% of Grade7 girls and none of the Grade 7 boys were found to drink water (p 0.002).

No comparison could be made between products consumed by Grade 3 children on weekdays and on weekends and school holidays. The different products consumed by Grade 3 children of both sexes are shown in **Table 29.**

Table 29. Products consumed by Grade 3 children of both sexes

Product	Total (n=73)		Boys (n=33)		Girls (n=40)	
	f	%	f	%	f	%
Porridge	40	54.7	15	45.4	25	62.5
Bread	17	23.2	4	12.1	13	32.5
Eggs	3	4.1	1	3	2	5
Meat	1	1.3	0	0	1	2.5
Juice	16	21.9	8	24.2	8	20
Tea*	13	17.8	2	6*	11	27.5*
Milk**	9	12.3	0	0**	9	22.5**
Coffee	2	2.7	1	3	1	2.5
Water	5	6.8	3	9	2	5
TOTAL	**106**		**34**		**72**	

*p=0.017 **p=0.004

The products most frequently consumed by the younger group were porridge (54.7%), bread (23.2%) and juice (21.9%). Other products such as eggs, meat, tea, milk, coffee and water were found to be consumed by fewer children.

Some statistically significant differences were found: It was observed that a larger percentage of girls (27.8%) than boys (6%) drank tea (p 0.017) while2.5% of girls and none of the boys drank milk (p 0.004)which was consumed by only 12.3% of Grade 3s.

Table 30 shows the differences in consumption of milk and water among children attending the four schools: the consumption of these products among Grade 7s on weekdays and its overall consumption among Grade 3s.

Table 30. Differences in consumption of milk and water among children attending the four schools.

	Grade 7 (n= 144)							
Week Days	J.G.P.S. (n=57) f	%	H.F (n= 22) f	%	Y.B. (n=30) f	%	G.P (n=35) f	%
Milk	12	21.1	8	36.4	6	20	10	28.6
Water	10.8	19.3	1	4.5	0	0	4	11.4
Overall	**Grade 3 (n= 73)**							
Milk	7	23.3	1	20	0	0	1	7.1
Water	1	3.3	0	0	2	8.3	2	14.3

The highest consumption of water among Grade 7s was found at Johannesburg Girls, (J.G.P.S.) where 19.3% of Girls consumed water on weekdays (average consumption of water was 11.1%) while the highest water consumption among Grade 3s was found at Greenside Primary (G.P.) where 14.3% of children drunk water (average water consumption among Grade 3s was 6.8%).

4.4 Mothers'/guardians' knowledge, attitudes and perceptions regarding children's breakfast consumption.

4.4.1 Mothers'/guardians' frequency of breakfast consumption.

Mothers/guardians were asked to select from five categories how often they had breakfast (question No. 9). Their answers were compared to those given by Grade 7 children (question No 8). Due to the simplicity of the questions asked to Grade 3s, only differences in daily breakfast consumption between mothers/guardians and Grade 3 children (question No 7) could be obtained. It was observed that the frequency of children's breakfast consumption was similar to that of their mothers/guardians. This data is shown in **Table** 31.

Table 31. Comparison of frequency of breakfast consumption between mothers/guardians and children.

Frequency	Grade 3 Mothers (n=52)		Grade 3 Children (n=73)		Grade 7 Mothers (n=128)		Grade 7 Children (n=144)	
	f	%	f	%	f	%	f	%
Daily	29	56.9	40	65.8	64	50.7	74	51.4
Weekdays	3	5.9	-	-	3	2.3	12	8.3
Weekends	7	13.7	-	-	14	11.1	5	3.5
Very seldom	10	19.6	-	-	41	32.5	34	23.6
Never	2	3.9	0	0	4	3.1	2	1.4
Total	**51**	**98**	**40**	**65.8**	**126**	**98.4**	**127**	**88.1**

It was found that 56.9% of mothers/guardians of Grade 3s and 65.8% of Grade 3 children ate breakfast daily. The similarity in breakfast consumption between children and mothers/guardians was even closer among the Grade 7 group, where 50.7% of mothers/guardians and 51.4% of children ate breakfast daily and only 3.9% of mothers/guardians and 1.4% of children admitted that they "never " ate breakfast.

When comparing the information given by mothers/guardians regarding children's daily breakfast consumption with the information given by the children, it was observed that mothers/guardians over-reported children's daily breakfast consumption: 83.3% of Grade 3s and 60.8% of Grade 7s mothers thought their children had breakfast daily, while only 65.7% of Grade 3 children and 51.4% of Grade 7 children admitted to having breakfast daily.

4.4.2 Reasons why children ate or omitted breakfast.

Mothers/guardians were asked to select from 6 categories, reasons why they thought their children ate breakfast (question No.14). No significant differences were found in reasons given by mothers/guardians of Grade 3s and Grade 7s in the four schools. These findings are shown in **Table 32.**

Table 32. Reasons given by mothers/guardians why children of both ages ate breakfast.

Reasons given by mothers/guardians why children ate breakfast	Grade3's Mothers/guardians (n=52)		Grade 7's Mothers/guardians (n=128)	
	f	%	f	%
They are hungry	16	30.8	73	57
Mother insists	23	44.2	58	45.3
Rest of the family eat breakfast	17	32.7	45	35.1
They liked it	23	44.2	75	58.6
They think it is good for them	26	50	75	58.6
Don't know	2	3.9	1	0.1

It was found that the commonest reason why children ate breakfast according to their mothers/guardians was: "they thought breakfast was good for them" (50% of Grade 3s mothers/guardians and 58.6% of Grade 7s mothers/guardians respectively).

Mothers/Guardians were asked to select from 6 categories reasons why they thought their children omitted breakfast (question No.11). Although this question was directed to those mothers whose children "never" eat breakfast, it was found that out of 180 mothers/guardians, 84 (46.6%) answered this question. Each mother/guardian selected only one reason why she thought her child omitted breakfast. These findings are shown in **Table 33.**

Table 33. Reasons given by mothers/guardians why children omitted breakfast.

Reasons	Mothers/Guardians (n = 84)	
	f	%
Child is not hungry	19	22.6
Not enough time	36	42.9
Family does not eat breakfast	6	7.1
Little food at home	4	4.8
Child prefers to buy at school tuck shop	15	17.9
Other	4	4.8
Total	**84**	**100**

According to mothers/guardians, the most common reason why children of both ages omitted breakfast was "not enough time" (42.9%), followed by "child is not hungry" (22.6%).

4.4.3 People involved in breakfast preparation

Mothers/guardians were asked who usually prepared children's breakfast (question 15). The answers are shown in **Table 34.**

Table 34. Who prepared children's breakfast

Person who prepares breakfast	Grade3's Mothers/Guardians (n=52)		Grade 7's Mothers/Guardians (n=128)	
	f	%	f	%
Mother/Guardian	26	50	41	32
Maid	3	6	1	0.8
Child	2	3.9	50	3.9
Older sibling	7	13.4	2	1.5
Father	2	3.9	0	0
Other	3	6	0	0

A larger number of Grade 3's mothers/guardians (50%) than Grade 7's mothers/guardians (32%) prepared their children's breakfast. Mothers/guardians reported that 3.9% of Grade 3 children and 39% of Grade 7 children prepared their own breakfast.

4.4.4 Breakfast foods and drinks most frequently consumed by children, according to their mothers/guardians.

Mothers/guardians were asked to list the food and drinks usually consumed by children on weekdays (question No 12) and on weekends and school holidays (question No 13). No significant differences were found in the answers given by mothers/guardians of both groups of children attending the four schools. These findings are shown in **Figure 3** and **Figure 4**

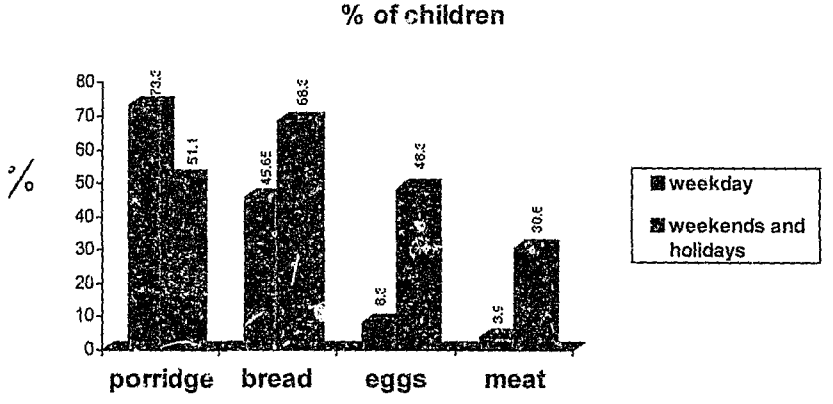

Figure 3. Food most frequently consumed by children of both age groups on school days and on weekends and holidays according to their mothers/guardians.

According to the mothers/guardians the food most frequently consumed by children of both ages was porridge on weekdays (73.3%) and bread on weekends and school holidays (68.3%).

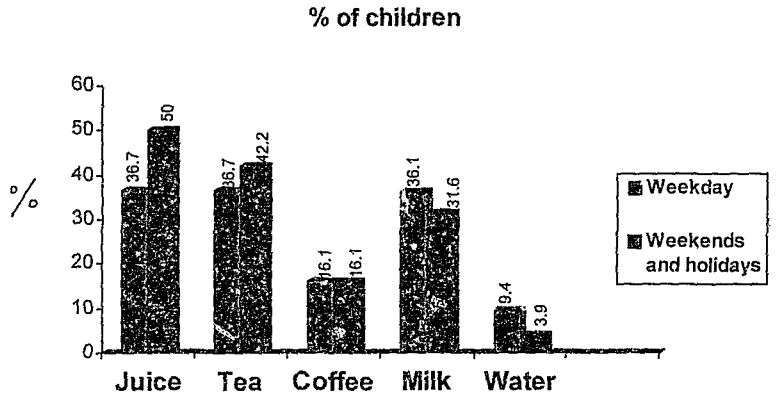

Figure 4. Mothers'/guardians' description of the drinks most frequently consumed by both groups of children on weekdays and on weekends and school holidays.

Mothers/guardians reported that the drinks most frequently consumed by children of both ages on weekdays were juice and tea (36.7% respectively), closely followed by milk (36.1%). It was found that juice was the drink most frequently consumed on weekends and school holidays (50%).

Due to the simplicity of the questions asked to the Grade 3s their answers could not be compared to the answers given by their mothers/guardians regarding the consumption of different products on weekdays and on weekends and school holidays. No significant differences were found when comparing the information given by Grade 7 children and their mothers/guardians in this regard.

4.4.5 Mothers'/guardians' perceptions of the importance of breakfast.

Mothers/guardians were asked to rate how important they thought breakfast was for their children (question No.16). It was found that 96% of all mothers/guardians rated breakfast as

"very important". They were also asked whether they thought breakfast helped to keep children healthy and benefit them (questions No. 17 and 18). In 97.8% of cases mothers agreed that breakfast helped to keep children healthy and all of them thought that breakfast was beneficial.

In question No 20, they were asked whether they thought their children needed to drink milk daily: 88.4% answered affirmatively. No significant differences were found in answers given by mothers/guardians of both groups of children attending the four schools.

Mothers/guardians were asked to select from 7 categories reasons why they thought breakfast was beneficial for their children .These findings are shown in **Table 35.**

Table 35. How breakfast benefits children.

Reasons	Total (n=180)		Mothers of Gr 3s (n=52)		Mothers of Gr 7s (n=128)	
	f	%	f	%	f	%
Improves school work	110	61.1	31	50	79	73.8
Makes them better nourished	121	67.2	25	40.3*	96	89.7*
Improves sports performance*	95	52.7	17	27.4*	78	75.7*
Makes them more friendly	51	28.3	13	20.9	38	40
Improves health*	137	76.1	37	59.6*	100	90.9*
Improves behaviour*	64	35.5	14	22.5*	50	51.5*
Other	41	22.7	9	14.5	32	52.5
Total	**619**		**146**		**473**	

*p =0.001

Each mother/guardian gave more than one reason why they thought breakfast was beneficial for their children. A total of 180 mothers/guardians provided 619 reasons (52 Grade 3s mothers/guardians yielded 146 reasons while 128 Grade 7s mothers/guardians yielded 473 reasons).

The commonest reasons why mothers/guardians of both groups of children thought breakfast was beneficial were: "it improves health" (76.1%), "it makes children better nourished" (67.2%) and "it improves school work" (61.1%). Statistically significant differences were found in reasons given by mothers/guardians of Grade 3s and Grade 7s. A larger percentage of Grade 7s mothers (90.9%) than Grade 3s mothers (59.6%) thought that "breakfast improves health" ($p < 0.001$).

A larger percentage of Grade 7s mothers (89.7%) than Grade 3s mothers (40.3%) agreed that "breakfast makes children better nourished" ($p< 0.001$). More than half of the Grade 7s mothers (75.7%) compared to only 27.4% of Grade 3s mothers thought that "breakfast improves sports performance" ($p < 0.001$), and 51.5% of Grade 7s mothers compared to only 22.5% of Grade 3s mothers thought that "breakfast improves behaviour" ($p < 0.001$).

4.5 Teachers' information

4.5.1 Children's class position and absenteeism

In the "teachers' information sheet" each class teacher was asked to state the class position and days absent from school of each child taking part in the study (questions No. 3 and 4). Although all teachers involved completed the information sheets from all children taking part, in some cases they failed to give all the information requested and in 59 cases (27.1%) teachers were unable to establish the class position of children in the younger group. The information given by teachers in this regard is shown in **Table 36.**

Table 36.Class position of children of both age groups

Class position	Children (n = 217)		
	f	%	cumulative %
1st - 10th place	51	32.3	32.3
11th – 20th place	45	28.6	60.9
21st – 30th place	22	14.1	75
31st – 41st place	10	6.1	81.1
42nd – 54th place	10	6.1	87.2
55th – 86th place	20	12.2	99.4
TOTAL	**158**	**72.8**	**100**

It was observed that 32.3% of children were placed in the first 10 positions and 75% of children were in the first 30 positions.

The number of days children were absent from school are shown in **Table 37**.

Table 37. Children's days absent from school.

Days absent	Children (n = 217)		
	f	%	cumulative %
0	60	27.8	27.8
1-5	101	46.8	74.5
6-10	29	13.4	88.0
11-15	15	7.1	94.9
16-34	11	5.1	100
TOTAL	**216**	**99.5**	

At the time the study was conducted (November 1997) it was observed that 27.8% of children were never absent from school and 46.8% were absent between 1 and 5 days. No significant differences in absenteeism were found between children of both groups attending the four schools.

4.5.2 Children's school problems

Teachers were asked to select from 4 categories different problems they might have noticed in the children (question No. 5).These problems were selected for being easy for the

teachers to assess without performing psychological test. These findings reported by teachers are shown in **Table 38.**

Table 38. Problems found among children of both age groups.

Problem	total (n=217)		Grade 3s (n= 73)		Grade 7s (n=144)	
	f	%	f	%	f	%
Lack of concentration	78	35.9	34	46.6	44	30.6
Restlessness	41	18.8	23	31.5	18	12.5
Sleepiness	22	0.1	13	17.8	9	6.3
Other*	35	16.1	21	28.8	14	9.4
TOTAL	**176**		**91**		**85**	

* "Other" problems given by teachers: lazy, withdrawn, has bad colds, lack of confidence, gets distracted easily, distracts others, often teased, insecure, problems, haemophilia, stutters, quiet, giddy, day dreamer.

All problems were more frequent among the younger group. The most common problem was "lack of concentration" which was found in 35.9% of children (46.6% of Grade 3s and 30.6% of Grade 7s). This difference was not statistically significant. No statistically significant differences were found between children of both sexes. It was observed that teachers reported a total of 176 problems among 217 children taking part in the study: 91 problems among 73 Grade 3s and 85 problems among 144 Grade 7s (mean = 1.2 among Grade 3s and 0.5 among Grade 7s). Although some children were reported as not having any problems, in some cases a maximum of 3 problems per child was indicated. These findings are shown in **Table 39.**

Table 39. Differences in number of problems among children of both groups.

No of problems	Total of children(n = 217) f	%	Grade 3s (n = 73) f	%	Grade 7s (n = 144) f	%
0	111	51.1	21	28.7	90	62.5
1	52	23.9	22	30.1	30	20.8
2	49	22.5	29	39.7	20	13.8
3	9	4.1	4	5.4	5	3.4
4	0	0	0	0	0	0
TOTAL	221		76		145	

It was observed that 51.1% of the chil[illegible]n were reported as not having any problems. This percentage was higher among Grade 7s (62.5%) than among Grade 3s (28.7%). None of the children were reported as having more than 3 problems. The difference in number of problems between children of both sexes is shown in **Table 40.**

Table 40. Difference in number of problems between children of both sexes.

No of problems	Total of children(n = 217) f	%	Boys (n = 82) f	%	Girls (n = 135) f	%
0	111	51.1	28	34.1	83	61.4
1	52	23.9	20	24.3	32	23.7
2	49	22.5	30	36.5	19	14
3	9	4.1	6	7.3	3	2.2
4	0	0	0	0	0	0
TOTAL	221		84		137	

It was shown that a larger number of girls (61.4%) than boys (34.1%) were reported as not having any problems. Two problems were more frequently encountered among boys (36.5%) than among girls (14%). These differences were not statistically significant.

Teachers were asked to rate their overall impression of the children as either "good", "fair", or "poor"(QuestionNo.6). These findings are shown in **Table 41.**

Table 41. Teachers' overall impression of the children: Differences between age groups.

Impression	Total (n = 217)		Grade 3s (n = 73)		Grade 7s (n=144)	
	f	%	f	%	f	%
Good	122	56.2	28	40.6	94	65.7
Fair	72	33.1	32	46.4	40	28
Poor	18	8.2	9	13	9	6.3
TOTAL	**212**	**97.6**	**69**	**94.5**	**143**	**99.3**

More than half of the children (56.22%) made a "good impression" to their teachers. This finding was more common among Grade 7s (65.7%) than among Grade 3s (40.6%). A larger percentage of Grade 3s (46.4%) than Grade 7s (28%) made a "fair impression". No statistically significant difference in this regard was found between children of both sexes.

In question No. 7 teachers were asked to add any relevant comments about the children. In some cases, more than one comment per child was made. These comments were grouped under the following categories:

a) Behavioural/learning problems

b) Medical problems

c) Family problems

d) Good comment: "tries hard"; "hard worker"; "responsible; "good student"

e) Poor comment: "often tired"; "academically weak"; "poor maths"; "incomplete work; "poor self esteem"

f) Other: "often late"; "unhappy"; "serious about life".

Table 42 shows an analysis of the different comments made by teachers and **Table 43** shows a comparison of the comments made about children of both groups.

Table 42. Comments made by teachers.

Comments	Children (n = 217)	
	f	%
Behavioral and learning problems	28	12.9
Medical problems	3	1.3
Family problems	6	2.7
Good comment	37	17
Poor comment	18	8.2
Other	12	5.5
TOTAL	**104**	

Table 43. Comments made by teachers: Comparison between children of both ages.

Comments	Total (n=217))		Grade 3s (n = 73)		Grade 7s (n=144)	
	f	%	f	%	f	%
Behavioral/learning problems	28	12.9	16	21.9	12	8 3
Medical problems	3	1.3	1	1.3	2	1.3
Family problems	6	2.7	3	4.1	3	2
Good comment	37	17	24	32.8	13	9
Poor comment	18	8.2	8	10.9	10	6.9
Other	12	5.5	1	1.3	11	7.6
TOTAL	**104**		**53**		**51**	

It was observed that the group of 20 teachers provided 104 comments regarding 217 children (53 comments concerning 73 Grade 3s and 51 comments concerning 144 Grade 7s). The most frequent comment made by teachers fell under the "good comment" category (17%). This finding was more common among Grade 3s (32.8%) than among Grade 7s (9%). Behavioural and learning problems were reported in 12.9% of children:21.9% of Grade 3s compared to only 8.3% of Grade 7s. No statistically significant differences were found between children of both sexes.

Although teachers did not report comments regarding all the children, 2 comments per child were reported in some cases. These findings are shown in **Table 44.**

Table 44. Number of comments regarding children: Differences between the two groups.

No of comments	Total (n = 217)		Grade 3s (n = 73)		Grade 7s (n = 144)	
	f	%	f	%	f	%
0	117	53.9	23	31.5	94	65.2
1	91	41.9	47	64.3	44	30.5
2	13	5.9	6	8.2	7	4.8
TOTAL	221		76		145	

It was observed that 53.9% of children did not get any comment from the teacher; this percentage was larger among Grade 7s (65.2%) than among Grade 3s (31.5%); 41.9% of children (64.3% of Grade 3s and 30.5% of Grade 7s) obtained only one comment, and a very small percentage (5.9%) received 2 comments.

4.5.3 Relationship between breakfast consumption and children's school problems.

An attempt was made to establish a relationship between children's frequency of breakfast consumption and their class position, absenteeism, different problems as lack of concentration, restlessness, sleepiness and "other problems" mentioned by teachers as shown in Table 38 (page 72) and to link the teachers' overall impression of the children as shown in Table 41 (page 74), to different patterns of breakfast consumption.

This study failed to demonstrate any relationship between frequency of breakfast consumption and any of the above mentioned variables among Grade 3 children. Interesting findings where observed when comparing the relationship between breakfast consumption and class position among Grade 7 children as shown in **Table 45.**

Table 45. Relationship between frequency of breakfast consumption and class position among Grade 7 children (comparison between the four schools)

Variable		J.G.P.S. Breakfast			H.F. Breakfast		
		Daily	Seldom	Never	Daily	Seldom	Never
	Mean	34.4	58	0	12	17	18
Class position	Sd	4.91	4.79	0	0.83	4.9	9.81
	n	20	21	0	12	4	1
	p value	**0.001**			**0.722**		
		Y.B. Breakfast			G.P. Breakfast		
		Daily	Seldom	Never	Daily	Seldom	Never
	Mean	15.7	15.8	22	13.1	13	0
Class position	Sd	2.19	3.42	9.05	1.17	5.74	0
	n	18	7	1	24	1	0
	p value	**0.24**			**0.073**		

J.G.P.S. was the only school where statistically significant differences were found between frequency of breakfast consumption and class position: the mean class position of children who consumed breakfast daily was 34th compared to 58th for those who consumed breakfast seldom (p 0.001).

No statistically significant relationship was found when comparing any of the other variables and frequency of breakfast consumption among Grade 7s.

Chapter 5.

Discussion

This study looks at the knowledge, attitudes and awareness of urban schoolchildren and their mothers regarding breakfast. The following topics are discussed: response rate, frequency of breakfast consumption among children of different age and sex; products consumed by children at breakfast; mothers'/guardians' knowledge and attitudes regarding children's breakfast consumption and whether there is a relationship between breakfast consumption and school performance. Socio-economic factors that can affect breakfast consumption as well as possible reasons for omission of breakfast are analysed.

5.1 Response Rate.

The response rate as a whole is high (Table 1 page 38) : 100% among teachers, 82.8% among children (81.1% among Grade 3s and 79.1% among Grade 7s) and 68.7% among mothers/guardians (57.7% among Grade 3s mothers/guardians and 74.4% among Grade 7s mothers/guardians). The response rate among Grade 7 children and their mothers/guardians is similar (79.1% and 74.4% respectively) while it seems that the difference in response rate among Grade 3s and their mothers/guardians (81.1% and 57.7% respectively) is due to the fact that at Greenside Primary, although 70% of the Grade 3s selected were given permission by their parents to take part in the study, for unknown reasons none of their mothers/guardians returned their questionnaires (Table 2 page 40).

Absence from school on the day that the study was conducted was the reason why 45 children (17 Grade 3s and 28 Grade 7s) did not take part.

5.2 Children's attitudes and awareness regarding breakfast in relation to their age and sex.

The vast majority of children taking part in this study are Black (74.2%), as shown in Table 6 on page 42. This fact prevents the researcher from establishing comparisons among different ethnic groups.

As shown in Table 19 on page 51, the total percentage of children who consume breakfast daily is higher among Grade 3s than among Grade 7s (65.7% and 51.4% respectively) and more girls (58.2%) than boys (54.2%) consume breakfast daily. Although these differences are not statistically significant, significant differences in daily breakfast consumption are observed between boys and girls of both groups as shown in Figure 2 on page 52, 80% of Grade 3 girls and only 48.5% of Grade 3 boys have breakfast daily (p 0.006) and the percentage of girls that consume breakfast daily decreases considerably between Grade 3 and Grade 7: from 80% among Grade 3s to 49.5% among Grade 7s (p 0.003).

This phenomenon among girls, has also been reported by different researchers [1, 9, 44, 45] who interpreted it as the unwillingness to comply to family rules as children get older. This study does not show the same phenomenon among boys, where a moderate improvement in frequency of breakfast consumption with increasing age is found: 48.4% of Grade 3 boys consume breakfast daily compared to 57.1% of Grade 7 boys (Figure 2 on page 52).

In South Africa, Wolmarans *et al* [2] found that only 57.6% of black children attending Grade 5 had something to eat or drink five times per week. In the present study it was found that only 51.4% of Grade 7 children (of which the majority are Black), consumed breakfast daily (Table 18 on page 50).

Other local studies reported better results. In Lebowa, Steyn, Badenhorst and Nel [32] found that more than 80% of 289 school children aged 6 to 14 had breakfast. In their large survey, Walker *et al* [9] found that 81% of urban black adolescents did have breakfast but this percentage decreased to 79% among rural blacks. (The present study indicates that only 65.7% of Grade 3s and 51.4% of Grade 7s have breakfast daily as shown in Table 18 on page 50).Breakfast consumption among school children was found to be higher in developed countries, where the percentage of children who omitted breakfast ranged from only 3% to 16% [1, 34, 35, 36, 37].

Although the present study shows a high percentage of children who do not consume breakfast daily, (34.2% of Grade 3s and 48.6% of Grade 7s), the number of children who "never" eat breakfast is low: none of the children in the younger group and only 1.4% of children in the older group admit that they "never" eat breakfast.(Table 18 on page 50).

5.3 Differences in children's frequency of breakfast consumption in relation to distance from home to school.

Some differences are found when analysing breakfast consumption patterns among children attending the four schools (Table 20 on page 53) Johannesburg Girls is the school with the largest percentage of Grade 3s who eat breakfast daily (76.7%) and Yeoville Boys is the school which has the smallest percentage of Grade 3s who eat breakfast daily (45.8%). The average percentage of daily breakfast consumption among Grade 3s is 65.7%. Greenside Primary is the school with the highest percentage of Grade 7s who eat breakfast daily (68.5%) while Johannesburg Girls is the school which has the lowest percentage of Grade 7s who eat breakfast daily (35%). The average percentage of daily breakfast consumption among Grade 7s is 51.4% (Table 18 on page 50).

It is observed that children who attend the same school and reside in the same area do not have similar patterns of breakfast consumption. Johannesburg Girls is the school which has the highest percentage of Grade 3s (76.7%), as well as the lowest percentage of Grade 7s (31.5%) who consume breakfast daily; this finding is possibly due to the deterioration of healthy eating habits with increasing age, as reported by other researches [1, 9, 44, 45], and it is probably unrelated to the distance that children have to travel to school.

No statistically significant differences were found regarding frequency of children's breakfast consumption in relation to distance to school (Table 21 on page 54).

5.4 Children awareness and perceptions regarding breakfast.

When analysing this issue, it seems that the majority of children believe that the consumption of breakfast is beneficial. This study shows that the most common reasons why Grade 3 children like breakfast are because "it makes them healthy" and "it prevents them from getting hungry" (35.6% and 24.6% respectively as shown in Table 25 on page 56 no statistically significant differences are found in answers given by Grade 3 children of both sexes.

The most common reason why Grade 7 children consume breakfast is because "they like it" (74.8%). A statistically significant difference is found between children of both sexes:88.8% of boys compared to 68% of girls give this answer (p 0.011). The second most common reason given by Grade 7 children of both sexes is that they eat breakfast because "they think it is good for them" (72.1%). These findings are shown in Table 26 on page 57. As shown in Table 27 on page 59, a large percentage of Grade 7 children of both sexes link breakfast to health (94.4%) and better nourishment (84.7%) while 77.7% relate breakfast to improvement in sports perfomance and only 43% of them relate it to improvement in school performance. No statistically significant differences are observed in answers given by children of both sexes.

These findings differ from the ones found by Steyn *et al* [15] . They examined the perceptions of a group of 182 children aged 9 to 15 years regarding a school nutrition program in four provinces of South Africa.. They found that over 70% of children expressed feeling less hungry and able to concentrate better, associating breakfast consumption with school perfomance. An inconsistency is detected between children's perceptions of the importance and benefits of breakfast and the their actual frequency of breakfast consumption. Although

the majority of grade 3s (94.5%) think breakfast is important and it is reported as either very important (52.1%) or important (25.7%) by Grade 7s, only 65.7% of Grade 3s and 51.4% of Grade 7s admit consuming breakfast daily (Table 18 on page 50). Although the reasons for this discrepancy can not be explained, it can be speculated that children tend to give expected "correct" answers to certain questions, and to answer more spontaneously when asked about daily routines as for example breakfast consumption.

5.5 Socio- economic factors that can influence breakfast consumption.

It was anticipated that certain socio-economic factors such as number of children in the family, mothers'/guardians' occupation and the time they live home for work, as well as children's residential area, and means of travelling to school could influence children's frequency of breakfast consumption. The Kellogg Survey [44] conducted in the U.K. in 1975, showed that mothers' educational level, whether they worked outside the house as well as family size, strongly influenced children breakfast consumption. The present study does not show a statistically significant relationship between frequency of children breakfast consumption and whether mothers/guardians work outside the house, their standard of education, or the time they live home for work. Contrary to what was expected, the time at what working mothers left home, did not influence the frequency of children's breakfast consumption (Table 23 on page 55).

No statistically significant relationship between frequency of breakfast consumption and family size, indicated by the number of children in the family can be demonstrated (Table 24 on page 56). Although this study does not group children in socio-economic categories according to family income, areas of residence can be considered as a gross indicator of socio-economic status, which is expected to influence children's patterns of breakfast

consumption. It is also believed that children who travel longer distances are more inclined to omit breakfast due to lack of time. This study did not find a statistically significant relationship between children's residential area or means of travelling to school and their frequency of breakfast consumption (Table 22 and Table 21 on page 54 respectively).

5.6 Children's breakfast eating behaviour: food and drinks consumed at breakfast.

It is important to know the different products consumed by children at breakfast, not only to identify their preferences but also to get information regarding the availability of food at home. Although the questionnaires and interviews used in this study did not elicit a detailed food history, it is still possible to identify the products consumed at breakfast by both groups of children.

Products from the five different food groups (milk, meat, vegetable/fruits, grain and fat) should be consumed at breakfast in order for this meal to adequately contribute towards the daily nutritional requirements [28]. It has also been indicated that in order to maintain efficiency later in the morning, breakfast should provide at least a quarter of the daily energy and a quarter of the daily protein requirements [3]. Research has indicated that nutritional losses derived from an inadequate breakfast are not made up by other meals taken during the rest of the day [5, 6, 7]. Despite these recommendations, it is observed that children in the study consumed few products at breakfast, and these are mainly from the grain group.

When analysing the products consumed by Grade 3 children as shown in Table 29 on page 62, it is noticed that the most consumed products are porridge, bread and juice (54.7%, 23.2% and 21.9% respectively). Although tea and milk are consumed by fewer children (17.8% and 12.3% respectively), a statistically significant difference in its consumption is

observed between Grade 3 children of both sexes: 27.5% of girls and only 6% of boys drink tea (p 0.017) and 22.5% of girls and none of the boys drink milk (p 0.004). Products such as eggs and meat are consumed by a very small percentage of Grade3 children (4.1% and1.3% respectively) .

As shown in Table 28 on page 60, a large percentage of grade 7 children consume porridge (72.9%) and bread (44.4%) and drink juice (43.7%) on week days. As it was reported by various authors [22, 26, 27, 34] bread can make a valid contribution to the daily diet. Although bread is a good choice for breakfast, it needs to be supplemented with products from other food groups as for example milk, fruit and peanut-butter in order to be able to comply with the requirements [3] .

The findings of the present study agree with other researchers'. Previous studies conducted by in Lebowa by Steyn, Badenhorst and Nel [32] and in four provinces of South Africa by Steyn *et al* [15], found that tea, porridge and brown bread were the most popular items among school children. Wolmarans *et al* [2] found that breakfast cereal was the product most commonly consumed by children in Pretoria while bread was most frequently consumed in the West Rand. The present study also shows that the consumption of other products such as eggs and meat is very low among Grade 7s on week days (9% and 2.7% respectively) but increases on weekends and school holidays: eggs consumption increases from 9% on weekdays to 36.8% on weekends and school holidays, while meat consumption increases from 2.7% on weekdays to 19.4% on weekends and school holidays (Table 28 on page 60) This phenomenon can be due to the fact that more time is available on weekends and school holidays for breakfast preparation and consumption.

Some statistically significant differences in products consumed by Grade 7 children of both sexes on weekends and school holidays are observed: 55.1% of boys compared to 74.7% of girls eat bread (p 0.017) and 28.5% of boys compared to 56.8% of girls drink juice (p 0.001) (Table 28 on page 60).

The consumption of milk deserves attention. Although its importance has been emphasized by local and international authors [25, 30], this study shows a very low consumption of milk among both groups of children as shown in Table 28 on page 60: only 25% of Grade 7s consume milk on weekdays (16.3% of boys and 29.4% of girls) and 18.7% of them on weekends and school holidays (16.3% of boys and 20% of girls). These finding contradict Grade 7 children's perceptions of the importance of milk: 66.4% of them think that milk must be included in their diets.

Milk consumption is alarmingly low among Grade 3 children as shown in Table 29 on page 62 only 12.3% of them drink milk, with a statistically significant difference found among children of both sexes: 22.5% of girls drink milk while none of the boys do (p 0.004). As shown in Table 30 on page 63, in Yeoville Boys, none of the Grade 3 children consume milk. Locally Wolmarans *et al* [2] reported that only 5% of black children in the West Rand drunk milk and 34% of them added milk to their tea and coffee. Milk consumption was found to be higher in European countries: among Spanish children, Ortega *et al* [1] found that 53% of them consumed milk and among French children Prezosi *et al* [31] found that over 80% of children and adolescents consumed milk.

An interesting finding is that some children consume water at breakfast, which has not been reported by other authors. While water consumption is low among Grade 3s (6.8%) as shown in Table 29 on page 62, its consumption is higher among Grade 7s on weekdays (11.1%)

with a statistically significant difference between children of both sexes: as shown in Table 28 on page 60 none of the Grade 7 boys drink water on weekdays, compared to 16.8% of the Grade 7 girls (p 0.002).

As shown in Table 30 on page 63, the highest water consumption occurs among Grade 7s attending JGPS where 19.3% of them drink water on weekdays. Regardless speculation that children attending Greenside Primary are expected to have a high socio-economic status, 11.4% of its Grade 7s drink water at breakfast, indicating that this fact is probably due to lack of knowledge about healthy eating habits and not to unavailability of food at home. None of the children involved reported eating fruit at breakfast.

5.7 Relationship between breakfast consumption and school performance.

This study attempts to establish a relationship between breakfast consumption and school performance based on the observations made by teachers. Among the younger group, no relationship is found between consumption of breakfast and class position, absenteeism, lack of concentration, restlessness, sleepiness and "other problems" mentioned by teachers. The teachers' overall impression of the children is not related to children's consumption or omission of breakfast. The same findings apply to the older group with the exception of position in class, which is found to be related to frequency of breakfast consumption among Grade 7 children attending J.G.P.S. In this school, it is observed that children who consume breakfast daily have higher mean class position than those who consume breakfast seldom (34th and 58th respectively) (p value 0.001) (Table 45 on page 77). In a large breakfast survey, Walker et al [9] did not find any relationship between breakfast consumption and neither class position nor absenteeism among adolescents aged 16 to 18 years

Brown and Sherman [14] have tried to explain that the discordance in results obtained when analysing breakfast consumption and school perfomance were due to the fact that the test used seemed to be unsuitable to evaluate the complex interaction between nutritional status and cognitive deve'opment.

5.8 Mothers/guardians knowledge and attitudes regarding breakfast: comparison of findings between mothers/guardians and children.

As shown in Table 31 on page 64, close similarity is found when comparing mothers'/guardians' and child'en's frequency of breakfast consumption. Among the Grade 3 group, 56.9% of the mothers/guardians and 65.8% of the children eat breakfast daily and this similarity is more obvious among the older group where 50.7% of mothers/guardians and 51.4% of the children have breakfast daily. This finding indicates how family members, in this case mothers, can influence children's eating habits, which is an observation reported by other authors [42,43] .

Children's breakfast consumption is over-reported by mothers/guardians of both groups of children: 83.3% of mothers/guardians of Grade 3s and 68.8% of mothers/guardians of Grade 7s report that their children have breakfast daily, while only 65.7%of Grade 3's and 51.4% of Grade 7's give the same information (Table 18 on page 50). It seems that children tend to respond more spontaneously, while mothers/guardians are inclined to give "correct expected" answers; this can be due to the fact that a large percentage of mothers/guardians have a high level of education (Table 15 on page 48).

As shown in Table 32 on page 65, the commonest reasons why mothers/guardians of both groups of children think children eat breakfast is "because breakfast is good for them ", (50% of Grade 3's mothers and 58.6% of Grade 7,s mothers) No statistically significant differences are found in answers given by both groups of mothers/guardians.

Due to the simplicity of the questions asked to the Grade 3s, comparability of data between mothers/guardians and younger children can not always be established. No differences are observed when looking at the reasons for breakfast consumption given by Grade 7 children and their mothers/guardians. The commonest reasons given by Grade 7s is "they like breakfast" (74.8%) (Table 26 on page 57). No significant differences are seen in the answers given by children of both sexes. The same reason is given by mothers/guardians (Table 32 on Page 65). No statistically significant differences are found in the answers given by mothers/guardians of both groups of children.

When exploring the reasons why mothers/guardians think their children do not eat breakfast, it is observed that 46.6% of them answered this question. As shown in Table 33 on page 66, the commonest reason which is indicated by 42.9% of mothers/guardians of both groups of children is "lack of time". Lack of food at home is not an important factor for breakfast omission in the group studied: only 4.8% of the mothers/guardians that answer to this question mention it. It can be speculated that some mothers/guardians who have this reason in mind, either choose not to answer the question or to select another option.

It is noticed that mothers/guardians as well as the children are the people usually involved in breakfast preparation (Table 34 on page 66). Among the Grade 3 group, it is observed that 60.4% of mothers/guardians prepare their children's breakfast and only 4.6% of the children

prepared their own; in 16.2% of cases, older siblings are involved in Grade 3s breakfast preparation. Although a large percentage of Grade 7 children prepare their own breakfast (47.1% compared to only 4.6% of Grade 3s), it is observed that a large percentage of Grade 7s mothers/guardians (38.6%) still prepare their children's breakfast. The fact that mothers/guardians as well as older siblings are involved in breakfast preparation emphasises the importance of educating family members about the benefits of a healthy diet, to try to improve the quality of breakfast as well as the frequency of its consumption.

Mothers/guardians and Grade 7 children give similar information regarding the food and drinks consumed by children on weekdays and on weekends and school holidays as shown in Figure 4 on page 68 and in Table 28 on page 60: porridge on weekdays is reported by 73.3% of mothers/guardians and by 72.9% of Grade 7s and bread on weekends and school holidays is reported by 68.3% of mothers/guardians and 68.1% of Grade 7s. Mothers/guardians and Grade 7 children agree that the drink most frequently consumed on weekdays and on weekends and school holidays is juice (reported by 36.7% of mothers/guardians on weekdays and on weekends and school holidays and by 43.7% of Grade 7s on weekdays and 47.2% of Grade 7s on weekends and school holidays respectively.

As shown in Figure 4 on page 68, it is observed that mothers/guardians over-report children's milk consumption: 36.1% of mothers/guardians report that their children consume milk, while only 12.3% of Grade 3's (Table 29 on page 62) and 25% of Grade 7's (Table 28 on page 60) give the same information. Water consumption is not reported at all by mothers/guardians.

No other studies analysing mothers' perceptions of the importance of children's breakfast consumption were found in the literature. This study indicates that the majority of mothers/guardians (96%) rate breakfast as very important, 97.8% of them think it helps to keep children healthy and they all agree that breakfast is beneficial for their children. These figures contradict the low percentage of daily breakfast consumption found among both groups of children.

Chapter 6.

Conclusions and recommendations.

This study has shown poor breakfast habits among the population of children studied indicated by the high percentage of children who omit breakfast, the small number of products consumed, the low intake of milk and the consumption of water. Since research indicates that the nutritional losses derived from an inadequate breakfast are not made up by other meals taken during the rest of the day [5, 6, 7] it becomes necessary to assess the nutritional status of these children.

The present study reveals that lack of time constitutes, as indicated by the mothers, the main reason for the omission of breakfast among the group studied. This issue could be addressed by making food available at the schools before the beginning of the classes. Although there are limited possibility of parents, teachers and health workers changing eating habits of children [9], certain interventions could be undertaken. Schools could attempt in obtaining information from the children about their preferences regarding food, in order to identify products which are not only nutritious, but are also liked by the children. School tuck-shops could supply products of recognized high nutritional value (fortified biscuits[47], cereals[29], bread[22,27] and milk[30]) as well as nutritional products selected by the children at a reasonable price, increasing in this way their availability and affordability to school children.

Poor socio-economic conditions such as lack of food at home and low educational level among mothers does not constitute an important contributing factor in the omission of breakfast among the group studied. It can thus be speculated that lack of knowledge regarding healthy eating plays an important role in children's poor breakfast habits.

The present study found a close relationship between mothers'/guardians' frequency of breakfast consumption and that of their children. It also shows that older siblings are frequently involved in breakfast preparation. Nutrition education programs implemented by the schools which involve the children as well as their mothers and siblings should be recommended.

Because it was found that breakfast habits deteriorates with increasing age, it is of substantial importance that children are exposed to nutritional education from a young age. A play approach to learning has been shown to be beneficial among young children [46].

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Appendices

A. Mothers'/guardians' questionnaire.

Dear Mom:

My name is Dr Pat Celaya. I am a post-graduate doctor doing research for my Masters Degree in Family Medicine. I am presently carrying out a research in different schools in Johannesburg, concerning children's breakfast.

The idea of the questionnaire that follows is by no means to test your knowledge, but to get your opinion about aspects of your child's nutrition and health.This questionnaire is anonymous. Your name, as well as your child's name will not be known to the teacher, the school, or to myself.

The number that you see in the questionnaire and the envelope will be used to match the questionnaire with your child's, and does not have identification purposes.
Neither your questionnaire nor your child's will have any influence on your child's schoolwork.

It would be appreciated if you make an effort to answer these questions and return the questionnaire to the child's class teacher in the same envelope provided to you in the next 2-3 days.

THANK YOU FOR YOUR VALUABLE TIME AND CO-OPERATION.

MOTHERS'/GUARDIANS' QUESTIONNAIRE.

1. Are you the child's mother? (Please Tick the correct answer)

a)Yes	b) No

2. If you are not the child's mother and are the child's guardian, are you related to the child?

   (Please tick the correct answer)

a) Yes	b) No

3. If you a ₃ related to the child, please state your relationship. ____ _____

4. What was your higher standard passed at school? _____

5. Have you completed any further education? (Please tick the correct answer).

a) Yes	b) No

6. If yes, what was your higher level of education obtained? (Please tick the correct answer).

a) College/Technikon diploma	
b) University degree	
c) Other (please explain)	

7. What is your present occupation? _____

8. If you work outside the house, at what time do you leave home? _____ ___

9. How often do you yourself usually eat breakfast? (Please tick the correct answer)

(a) every day	
(b) only on weekdays	
(c) only on weekends	
(d) never	
(e) very seldom	

10.How often does your child usually have breakfast? (Please tick the correct answer)

(a) Daily	
(b) Only on weekdays	
(c) Only on weekends	
(d) Only on school holidays	
(e) Very seldom	
(f) Never	
(g) You are not sure	
(h) Other (please explain)_____	

11. **If you answer "Never" to question No. 10, please answer this question.**

If your child does not eat breakfast do you think it is because (please tick yes/no for each question).

	YES	NO
(a) He/she is not hungry in the morning		
(b) He/she does not have enough time		
(c) The family does not have breakfast		
(d) There is little food at home in the morning		
(e) He/she prefers to buy something at the school tuck-shop		
(f) other reason (please explain) _____		

12. What does your child usually have for breakfast on schooldays ? (please complete in the space provided)

(a) To eat? _____

(b) To drink? _____

13. What does your child usually have for breakfast on weekends and holidays? (please complete in the space provided)

(a) To eat? _____

(b) To drink? _____

14. If your child eats breakfast do you think it is because (please tick **Yes/ No** for **each** question).

	YES	NO
(a) He/she is hungry		
(b) You insist that he/she must eat breakfast		
(c) The rest of the family eats breakfast		
(d) He/she likes it		
(e) He/she thinks is good for him/her		
(f) You do not know		
(f) Other reason (please explain)_____ _____		

15. If breakfast is prepared for your child, who usually prepares it ? (Please tick the correct answer).

(a) Yourself (mother/guardian)	
(b) Maid	
(c) Your child (G3/G7)	
(d) Older brother/sister	
(e) Father?	
Other (please explain) _____	

16. How important do you think breakfast is for your child? (Please tick one answer)

(a) Very important	
(b) Important	
(c) Average importance	
(d) It is not important	

17. Do you think breakfast helps your child to keep healthy? (please tick one answer)

(a) Yes	(b) No	(c) Do not know

18. Do you think breakfast benefits your child? (Please tick the correct answer)

(a) Yes	(b) No

19.If you answer Yes to question No 18, in what way do you think breakfast benefits your child? (Please tick Yes or No for each question)

	Yes	No
(a) It improves his/her school work		
(b) It makes him/her better nourished		
(c)It improves his/her sports perfomane		
(d) It makes him/her more friendly		
(e) It improves his/her health		
(f) It improves his/her behaviour		
(g) You think it helps in any other way (please explain)_____		

20.Do you think that at his/her age, your child still needs to drink milk daily? (Please tick the correct answer)

Yes	No

Please give reasons for your answer. _____

_____

21. Would you like to receive more information about breakfast?

(a) Yes	(b) No

THANK YOU FOR YOUR VALUABLE CO-OPERATION.

B.CHILDREN'S INTERVIEW : GRADE 3

1. Name of School _____

2. Age _____ years

3. Sex _____ (boy/girl)

4. Number of children in the family _____

5. Suburb where you live _____

6. How do you usually get to school?

(a) walk a short distance (less than 5 blocks)	
(b)walking a long distance (more than 5 block)	
(c) car/bus	
(d) *other* (please explain)	

7.Do you have breakfast everyday?_____ (Yes/No)

8. If yes - what do you have for breakfast?

(a) to eat _____

(b) to drink _____

9. If no - why? (Please explain)_____

10. If no- are there some days when you eat breakfast?_____(Yes/No).

11. What do you have on these days?

(a) to eat _____

(b) to

drink_____

12. Did you have breakfast today? _____(Yes/No).

13. If yes, what did you have?

(a) to eat? _____

(b) to drink?_____

14. Do you like eating breakfast?_____

Why?_____

15. Do you think it is important to eat breakfast?_____

Why? _____

C.GRADE 7: BREAKFAST QUESTIONNAIRE

Dear Pupil:

My name is Dr Pat Celaya, and I am interested in what children eat. The idea of the questionnaire is not to test your knowledge, but rather to ask you how you feel about breakfast.

Although your name will remain unknown to the teacher and to myself, and this questionnaire is not for school marks, I would greatly appreciate it if you would answer the questions honestly, and to the best of your ability.

THANK YOU FOR YOUR TIME AND YOUR VALUABLE CO-OPERATION.

GRADE 7: BREAKFAST QUESTIONNAIRE.

1. Name of School _____

2. Age _____ years

3. Sex _____ (boy/girl)

4. Number of children in the family _____

5. Suburb where you live _____

6. How do you usually get to school? (Please tick one correct answer)

(a) walk a short distance (less than 5 blocks)	
(b) walk a long distance (more than 5 block)	
(c) car/bus	
(d) other (please explain)	

7. Did you eat breakfast today? (Please tick the correct answer)

(a) Yes	(b) No

8. How often do you eat breakfast? (Please tick the correct answer)

(a) Daily	
(b) Only on weekdays	
(c) Only on weekends	
(d) Only on school holidays	
(e) Very seldom	
(f) Never	
(g) Other (please explain)_____	

If you answer "Never" to question No 8, go directly to question No 14.

9. Where do you usually eat your breakfast? (Please tick the correct answer).

(a) At the table with the rest of the family	
(b) At the table by yourself	
(c) Walking around the house while getting ready	
(d) On the way to school	
(e) Other (please explain)_____	

10. Who usually prepares your breakfast? (Please tick the correct answer)

(a) Yourself	
(b) Mother/guardian	
(c) Father	
(d) Older brother or sister	
(e) Maid	
(f) Other (please explain)_____	

11. What do you usually have for breakfast on school days? (Please complete in the space provided)

(a) to eat?_____

(b) to drink? _____

12. What do you usually have for breakfast on weekends and holidays? (Please complete in the space provided)

(a) to eat _____

(b) to drink? _____

13. If you do eat breakfast is it because (Please tick Yes or No for each question)

	Yes	No
(a)You are hungry		
(b) Your mother insists that you must eat breakfast		
(c) The rest of the family eats breakfast		
(d) You like it		
(e) You think it is good for you even if you are not hungry		
(f) You do not know		
(g) Other reason (please explain)		

14. Do you usually take lunch to school? (Please tick the correct answer)

(a) Yes	(b) No

15. Do you usually buy lunch from the school tuckshop?)Please tick the correct answer)

(a) Yes	(b) No

16. How important do you think breakfast is for you? (Please tick the correct answer)

(a) Very important	
(b) Important	
(c) Average importance	
(d) It is not important at all	

17.Do you think breakfast helps you to keep healthy? (Please tick one correct answer)

(a) Yes	(b) No	(c) Do not know

18. Do you think breakfast is good for you? (Please tick one correct answer)

(a) Yes	(b)

19. If you answered Yes To question No 18, in what way do you think breakfast is good for you ? (Please tick either Yes or No for each question)

	Yes	No
(a) It improves your school work		
(b) It makes you better nourished		
(c) It improves your sports perfomance		
(d) It makes you more friendly		
(e) It improves your health		
(f) It improves your behaviour		
(g) Other reason (please explain)		

20. Do you think that at your age you still need to drink milk? (Please tick one answer)

(a) Yes	(b) No

21. Would you like to receive more information about breakfast? (Please tick the correct answer).

(a) Yes	(b) No

THANK YOU FOR YOUR VALUABLE CO-OPERATION.

D.TEACHER'S INFORMATION SHEET

Dear Teacher:

My name is Dr Pat Celaya. I am a post-graduate doctor doing research for my Masters Degree in Family Medicine. I am presently carrying out a research in different schools in Johannesburg concerning children's breakfast. The title of this research is **"Knowledge, attitudes and perceptions of urban school children and their mothers regarding breakfast."**

One of the objectives of this research is to explore the relationship between breakfast consumption and school performance. In order to achieve this, I would appreciate if you could complete the following sheet for each child in your class taking part in this study.

A report of the results of the study will be made available to the school at a later stage.

THANK YOU FOR YOUR TIME AND VALUABLE CO-OPERATION.

Teacher information sheet.

1. Child's name: Will be printed on an adhesive paper in front of the envelope.

2.. Child's ethnic group (Please tick)

White Black Coloured Indian Other (specify)

3. Class position: _____

4. Days absent: _____

5. Particular problems (please tick)

(a) lack of concentration _____

(b) restlessness_____

(c) sleepiness_____

(d) other (specify)_____

6. Any comments:

_____

_____

_____

_____

_____

_____

E.PARENTS'CONSENT (GRADE THREE)

Dear Parent/Guardian:

My name is Dr Pat Celaya. I am a post-graduate doctor doing research for my Masters Degree in Family Medicine. I am presently carrying out a research in different schools in Johannesburg, concerning children's breakfast. The purpose of this research is to establish the role that breakfast plays in nutrition, health, and school performance of children.

Your consent is needed for your child in Grade 3 to be interviewed by myself at the school, during school hours. I will ask him/her a few simple questions about breakfast. I would also like to send a questionnaire to you, the mother/guardian, to be answered at home and returned to school. The questionnaires and interviews will be anonymous and all information will be treated as confidential. The objective of this study is not to test your or your child's knowledge. The answers will not influence your child's school marks.

Participation in this study is completely voluntary. .A brief report on the completed research will be available from the school at a later date. Your co-operation and interest in this matter will be appreciated. Please complete this tear off slip and return it to school as soon as possible.

I, Mrs _____, am willing that my child _____ in Grade 3 ____ takes part in the "Breakfast Interview".

F.PARENTS' CONSENT (GRADE SEVEN)

Dear Parent/Guardian:

My name is Dr Pat Celaya. I am a post-graduate doctor doing research for my Masters Degree in Family Medicine. I am presently carrying out a research in different schools in Johannesburg, concerning children's breakfast. The purpose of this research is to establish the role that breakfast plays in nutrition, health, and school performance of children.

Your consent is needed for your child in Grade seven to answer a questionnaire about breakfast. This will take place during school hours and it will consist of a few questions relating to different aspects of breakfast. I would also like to send a questionnaire to you, the mother/guardian, to be answered at home and returned to school. The questionnaire and interview will be anonymous and all information will be treated as confidential. The objective of this study is not to test your or your child's knowledge. The answers will not influence your child's school marks.

Participation in this study is completely voluntary. A brief report on the completed research will be available from the school at a later date. Your co-operation and interest in this matter will be appreciated. Please complete this tear off slip and return it to school as soon as possible.

I, Mrs _____, am willing that my child _____ in Grade 7____ take part in the "Breakfast Questionnaire".