

ABSTRACT

This dissertation is a health and safety issue and concerns the weight of student's schoolbags. For the purpose of this study it only deals with 1st year secondary school students. In their first year in secondary school the pupils have to study all subjects and then at the end of the year decide which subjects they like and they carry these until exam time.

In their first year at secondary school the students are adjusting to new experiences e.g. going from one teacher in primary school to many teachers with extra subjects, extra lessons and extra books. An investigation was conducted by the author to discover if the students are lifting schoolbags that are heavy and exceed the guidelines laid down in the Government Working Group Report 1998.

The research was conducted in three secondary schools, one all male, the second all female and the third were mixed male and female. There were 80 students in total surveyed, of which 52 male and 28 female. This should give a balanced view of the weight lifted and carried by the students in their first year at secondary school.

The literature review investigates similar studies and research conducted both nationally and internationally on the subject of heavy schoolbags. It researches studies from the industrial sector and looks at health and safety and what legislation is in place governing the weight of schoolbags.

The methodology shows the problems encountered in accessing the schools and the ethical issues in dealing with the students. It also looks at the research and the methods used to gather the data and information needed to compile the charts and figures listings. A detailed questionnaire was incorporated using qualitative and quantitative questions to gather the necessary information required from the schools and the students.

An interview was conducted with two physiotherapists. This coupled with questions raised in the Dáil and the answers given should give an overall view of the research carried out into the weight of the student's schoolbags.

The analysis of the findings is broken down to show the facts by school, by gender, by age, and by the percentage of the schoolbag weight compared to the body weight ratio.

There is a list charting each individual school, plus the combined schools and charts detailing with the overall and average weight of the three schools.

These results are finalised in a conclusion and recommendations chapter that show that the students are lifting and carrying schoolbags that are heavy and exceed the recommended guidelines set out in the Government Working Group Report of 1998. It is hoped that these results will be taken on board and acted upon to alleviate the heaviness of the student's schoolbag.

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TABLE OF CONTENTS

	Page no.
Abstract	ii
Acknowledgements	iv
Table of Contents	v
List of Charts and Figures	vii
List of Abbreviations	ix
List of Appendices	x
CHAPTER 1	Introduction
1.1	Introduction 1
1.2	Government Working Group Report 2
1.3	Rationale 3
1.4	Historical Perspective 4
1.5	Legislation 4
1.6	Scope & Limitations 5
1.7	Aims and Objectives 6
1.8	Plan of Development 7
CHAPTER 2	Literature Review
2.1	Context of Literature Review 8
2.2	History 8
2.3	Industrial Research 9
2.4	New Zealand Study 9
2.5	International & National Studies 10
2.6	Health & Safety 13
2.7	Legislation 15
2.8	Local Representative 17
CHAPTER 3	Methodology
3.1	Introduction 18
3.2	Access Issues 18

3.3	Ethical Issues	19
3.4	Questionnaire	20
3.5	Guidelines	23
3.6	Interview with Physiotherapists	24
3.7	School Talk	28
3.8	Dáil Questions	28
CHAPTER 4	Presentation of Results and Findings	
4.1	Introduction	30
4.2	Subject Matter	30
4.3	Unnumbered Questions	32
4.4	Numbered Questions	42
4.5	Conclusion of findings	61
CHAPTER 5	Conclusion & Recommendations	
	5.1 Conclusion	62
	5.2 Recommendations	63
CHAPTER 6	BIBLIOGRAPHY	66
APPENDICES		70

LIST OF CHARTS AND FIGURES

		<u>PAGE NO.</u>
Chart No. 1	Breakdown of Students' Gender	32
Chart No. 2	Breakdown of Students' Age	33
Chart No. 3	Breakdown of Age in relation to Weight Carried in the Female Sample School	34
Chart No. 4	Breakdown of Age in relation to Weight Carried in the Male Sample School	35
Chart No. 5	Breakdown of Age in relation to Weight Carried in the Mixed Sample School	36
Chart No. 6	Breakdown of Age in relation to Weight Carried in all Sample Schools	37
Chart No. 7	Breakdown of Weight Carried in relation To Gender	38
Chart No. 8	Average Weight Carried by Students in Each Sample School	39
Chart No. 9 Question 1.	Distribution of 1 st Year Subjects between the Three Sample Schools	41
Chart No. 10	Distribution of 2 nd Year Subjects between The Three Sample Schools	42
Chart No. 11	Each Genders' View on the Heaviness of Their Schoolbag	43
Chart No. 12	Ratio of Students who guessed to those Who did not guess.	44
Chart No. 13	Students' Estimated Weight of Schoolbag	44
Chart No. 14	Estimation of Distance Travelled by Students daily	46
Chart No. 15	Number of Students with a Locker Available for their use.	48

Chart No. 16	Students' View on whether their Locker Is large enough	49
Chart No. 17	Portion of Students using their Locker	50
Chart No. 18	Answer A or Answer B to Query	51
Chart No. 19	Students' view of the Purpose of a Locker	53
Chart No. 20	Mode of carrying Books to School	54
Chart No. 21	Students' Method of carrying Schoolbag	56
Chart No. 22	Number of Students with the use of a P.C. at home	57
Chart No. 23	C.D. ROMs versus Books as a means of Study	58
Chart No. 24	Students' views on how to Lighten Schoolbag	59

List of Abbreviations

Dáil	Seat of Government
FF	Fianna Fáil, Political Party in Ireland
FG	Fine Gael, Political Party in Ireland
GAA	General Application Act 1993
GWGR	Government Working Group Report 1998
HSA	Health & Safety Authority
HSW	Health Safety & Welfare Act 1989
Kg	Kilogram
TD	Teachta Dála, elected member of the Dáil

LIST OF APPENDICES

APPENDIX A	PILOT QUESTIONNAIRE	Page 70
APPENDIX B	SAMPLE PILOT QUESTIONNAIRE	Page 73
APPENDIX C	COVER PAGE FINISHED QUESTIONNAIRE	Page 76
APPENDIX D	PERMISSION PAGE FINISHED QUESTIONNAIRE	Page 78
APPENDIX E	FINISHED QUESTIONNAIRE	Page 80
APPENDIX F	SAMPLE FINISHED QUESTIONNAIRE	Page 83
APPENDIX G	DAIL QUESTIONS	Page 86
APPENDIX H	REPLIES TO DAIL QUESTIONS	Page 88
APPENDIX J	INTERVIEW QUESTIONS PHYSIOTHERAPISTS	Page 94

Chapter 1

INTRODUCTION

1.1 Introduction

The subject of this dissertation is a health, safety and welfare issue. The weight of schoolbags that children and students have to lift and carry to school has long been the topic of many debates especially in the last few years. The worrying factor through all the discussions is that it has not been proved conclusively that lifting heavy schoolbags damages the students back and spine (Casey & Dockrell 1996).

It has however been agreed among certain authors, who have conducted research into the subject, that lifting heavy schoolbags has the potential to cause back and spine problems later in life (Claire Small, The Times October 2003). The reason they have come to this conclusion is from studies that were conducted on the adult population (Cady et al 1979; Louhevaara et al 1985; Magnusson et al 1987). There has been much discussion on this subject and both sides of the argument have put certain facts and figures forward. The National Parents Council in a newspaper article claimed that children were lifting schoolbags weighing 11.4 kg (Irish News Ltd August 19th 2003).

It is this authors objective to investigate that students are lifting and carrying schoolbags that are heavy and exceed the guidelines laid down by the Government Working Group Report 1998 (GWGR1998). Within that report it is clearly stated that the weight of the schoolbag carried by the student should only be 10% or less of that student's body weight.

It also stated that based on average weights for males and females, the weight limit for 12-year-old students should be 3.7 kilograms (kg). It further stated that for 17-year-old students, that a weight limit should be imposed of 5.5kg for females and 6.2kg for males.

1.2 Government Working Group Report.

“He did not have his weetabix that day!”

“The Deputy is not having the right breakfast!”

These were two comments passed to Micheál Martin, by fellow Teachta Dála (TD), in the Dáil when he raised the question of the heaviness of children’s schoolbags (Dáil question time 97). Micheál Martin TD is a member of Fianna Fail, a political party, in Ireland. At the time of the comments his party was in opposition to the Government. It was in his position as spokesperson for Education and Science that prompted him to raise the question of the weight of schoolbags. It was also in his position as a father who was concerned for his children’s welfare that made him raise the question.

When Fianna Fail came into power in Government in September 1997

Micheál Martin was appointed Minister for Education and Science. It was in his position as Minister that he commissioned a working group to look into the weight of student’s schoolbags and to report back the findings with recommendations. Micheál Martin commissioned this report in 1997 and the report was published in 1998.

1.3 Rationale

For the purpose of this study 1st year students in three different secondary schools were chosen. The reason for this is, in their first year at secondary school, students study all subjects, e.g. French and German, Music and Art, Science and Business and many more. Then at the end of the year choices are made and the students choose which subjects they like best, e.g. French or German, Music or Art, and which subjects they hope they will do well in the Junior Certificate and the Leaving Certificate.

During this first year at secondary school the students have to carry extra books because they are studying the full range of subjects. For the purpose of the research study this will be a good place to start as the students are now maturing into young adults. When they were in primary school the students had only one teacher and he/she knew how much homework was given for the night. They have now moved to a new school with extra subjects to learn and one teacher per subject. Each individual teacher and their subject means more homework for the student. It may also mean that the student has to carry more schoolbooks to school and back home again to ensure they have their schoolwork and their homework completed.

It is within this context of having to bring the schoolbooks to school to study, which brings about the problem of the weight of the schoolbag. A detailed study is required to look at what our children carry with them in their school bags and how they carry them to school.

1.4 Historical Perspective

As more and more research is carried out investigating the heaviness of the schoolbags of the present day students perhaps we should first take a look at what system was in place previously. The researcher can only recall and speak from his experience of attending school in this country. The researcher attended primary school in the 1960s and progressed to secondary school in the early 1970s. The vast majority of students were never driven to school by car, as there was none available to bring them. Cars were not as plentiful as they are now and the researcher cannot remember anyone being driven to school except the teachers and their own children. The pupils either walked or cycled to school. The books that were needed for school were carried in a proper schoolbag. The type of schoolbag that was used to carry the schoolbooks in, was designed to be carried over two shoulders. The design of the schoolbag was such that, it would be very uncomfortable or near impossible for it to be carried over one shoulder. The schoolbooks that were carried to school in the schoolbag were only for one year. The author remembers doing various subjects in secondary school. In each of the three years leading up to the Intermediate Certificate exam, there was only one book for each specific subject in each year. Today, the system seems to be to have one book that combines the three years.

1.5 Legislation

There is no legislation in place to protect the student from lifting heavy schoolbags. Although according to the Minister for Education and Science, Mary Hanafin appointed in September 2004, all schools must have a safety

statement in place, which should cover the lifting of heavy schoolbags (See Appendix H).

It is this lack of legislation and protection that raises serious issues and serious questions and prompted this researcher to have these questions raised in the Dáil through a local representative, David Stanton TD of the Fine Gael Party (See appendix G & H). Legislation and the acts governing lifting are researched in more detail in 2.7 of the literature review section of this dissertation.

1.6 Scope and Limitations

The researcher enlisted the help of three secondary schools in the north Cork town of Fermoy. One was St Colemans an all-male school, the second was Loreto an all-female school and the third was Colaiste an Chraoibhin a mixed school of both males and females. The combination of the three different schools should give a balanced view of the weight of the schoolbags lifted and carried by the students. The total number of students from the three schools amounted to 80, 28 were female and 52 were male.

There were certain time constraints because each school had to be visited. In each school every student was weighed individually in conjunction with their schoolbag, so an assessment of the ratio of schoolbag weight to body weight can be established.

Two physiotherapists were interviewed to see what studies have been done by their organisations. One of the physiotherapists wished to remain anonymous the other is Sara Dockrell. Ms Dockrell is a lecturer at the School

of Physiotherapy Trinity College Dublin and was a member of the Governments working group of 1997.

1.7 Aims and Objectives

The aim is to gather as much information from the three schools and the students to discover the weight of the school bag being lifted and carried. This was achieved by first weighing the students without their schoolbag and then with the schoolbag. This will give the researcher the means to calculate the percentage weight of the schoolbag being carried against the student's weight. The same students who participated in the survey completed a detailed and researched questionnaire.

The main objective is to prove that the school bags the students are carrying are heavy and that the weight of the schoolbags lifted and carried by the students exceeds the guidelines recommended in the Government report of 1998.

The final objective is to use the research gathered to try to reduce the weight of the schoolbag. The results of the findings will play a major part in that decision. Along with research already conducted both nationally and internationally it should be possible to put together a plan of action to benefit both the students and their schools.

1.8 Plan of Development

This first chapter looks at the rationale behind the undertaking of this dissertation. It looks at the subject matter, the history and the aims and objectives of discovering the weight of the schoolbag. It raises certain questions that are answered later in the dissertation.

The second chapter is the literature review, this was under-taken to find supporting evidence of the dissertation or to find evidence disproving the theory.

The third chapter is the methodology section of the dissertation. It outlines the different methods that were used to gather the research needed and problems that were encountered while carrying out this study. It details the three schools and the students involved in the research, the two physiotherapists interviewed and the compiling of the questionnaire.

The fourth chapter is the analysis of the results and findings of the research that was carried out for this dissertation. It contains an explanation at the start of how the information is presented. This chapter contains the charts graphs and pie charts used to display the information that was gathered through the questionnaire and the weighing of the students and their schoolbags.

The fifth chapter is the conclusion and recommendations of all the findings that were gathered for this dissertation and is based on a result of all the data, information and findings conducted in this dissertation.

LITERATURE REVIEW

2.1 Context of Literature Review

The literature review contains the research carried out on findings by other authors into the weight of schoolbags. It looks at the history of different studies carried out e.g, the army, industrial lifting and it also looks at studies carried out both nationally and internationally.

2.2 History

The idea of research and study into the maximum weight an individual can carry or should be able to carry, and not have back pain is not a recent one. Research goes back to 1858 when a report by the British Royal Commission was conducted for the army into the weight of a bag that a soldier should carry into battle and still be an effective fighter. This report was referred to when Renbourn was carrying out his research into military life (Renbourn 1954). These reports looked at the maximum weight a soldier should be able to carry in conflict and still be an efficient fighter. Of course as time and technology has moved on, soldiers equipment has become much lighter but it is interesting to note that nearly 150 years ago studies were being conducted into the weight of bags that can be carried on the back (Applied Ergonomics June 1988).

An interesting calculation that Renbourn came up with was, as he called it the rule of thumb, that healthy fit males should be able to carry one-third their own body weight (Renbourn 1954). Realistically these soldiers are supposed to be fit and trained personnel and should be capable of carrying the weight of the

backpack. However even with all their training the soldiers still suffered with back pain and this was proved with a study conducted of the Falklands war (McCaig & Gooderson 1986).

2.3 Industrial Research

Research was also carried out into various sectors of industry with regard to lifting and carrying. A study was conducted into the butchering industry where individuals were carrying meat boxes up to 40-kg weight and meat parts up to 70-kg weight (Magnusson et al 1987).

A study was conducted on firemen with regard to the equipment they have to wear and have to carry or assemble. It was also taken into account that firemen will have to physically lift people, even down ladders (Louhevaara et al 1985). A different study carried out on over 1500 firemen showed that strength, fitness and physical conditioning had a preventative effect on back injuries (Cady et al 1979). Cady found that if the fireman trained day in day out simulating situations they find themselves in e.g. lifting a person down a ladder, then they were less likely to suffer from back injuries.

If part of the student's introduction into school life is how to lift and carry a schoolbag properly then maybe it might lessen the problem of back pain.

2.4 New Zealand Study

Jannine Whittfield carried out a comprehensive study in New Zealand in 1997 (Whittfield et al 1997). A total of 140 students were involved in the research to determine various aspects of the weight of schoolbags. The students were aged between 11-13 years and were made up of 70 males and 70 female students. In New Zealand the average weight, or mean as they call it, for the

11 year old was 6.3 kg and for the 13-year-old was 7.0 kg. These figures, when broken down into percentages of the ratio between schoolbag weight and body weight, was 13.2% and 10.3% respectively.

In this research study conducted on first year secondary school students in Ireland the ages were between 12-14 years, and the average weight carried by the 12 year old was 11.82 kg, by the 13 year old was 10.14kg, and by the 14 year old 10.38 kg. The full details of the study can be found in the findings and analysis section of this dissertation. Another factor that was highlighted in the Whittfield study was the lack of lockers available to students, which meant they had to carry the books around all day. In this study carried out in the three schools in Fermoy and answered in question 6 of the questionnaire, 100% of the students in the three schools surveyed had lockers.

2.5 International & National Studies

No study has been carried out to prove conclusively that lifting heavy schoolbags damages children and adolescents backs (Physiotherapy Ireland vol. 17 no.2). But, as each study is conducted more and more evidence is being linked to the fact that lifting heavy schoolbags has the potential to damage the backs and spine of children and young adults (Sheir-Neiss et al 2003).

As more and more studies are conducted into back pain the reporting of a high prevalence of back pain in children and young adults increases. This increase in back pain is coupled by the findings that the back pain also increases with age (Limon et al 2004). Lifting heavy schoolbags over a long period of time has the potential to cause back and spine problems. In theory

the student may not be injured in their first year at school. However, because they spend five to six years there, lifting and carrying heavy schoolbags, the odds of them getting injured are greatly increased with every year. Also, the students can carry with them into adult life, that weakness of the back, which has the potential to develop into severe or chronic back pain (Watson et al 2002). . An extensive research study was carried out on over 1400 students and it found that a large majority of the students were carrying schoolbags, which are above the 10% of their body weight (Laffan et al 1998).

A detailed study was carried out on the influence of carrying books on the gait cycle and posture of youths (Pascoe et al 1997). A video was set up to film 11-13 year old students as they walked and carried their schoolbags. It filmed the student with the schoolbag in different positions e.g. over one shoulder and over two shoulders. It then calculated the strain the student was under while carrying the schoolbag. It concluded the best position for carrying the schoolbag was over two shoulders. In this position the back was under the least amount of pressure and the least amount of energy was expended when walking (Pascoe et al 1997). In a pilot study carried out by Gemma Casey and Sara Dockrell in 1996 covers in much more detail the different authors behind this research.

This study was also supported by other research carried out by Malhotra and Sen Gupta (1965). However it must be taken into consideration that the amount of books has increased substantially since 1965 and indeed the weight of an individual book has increased in weight (O'Reagan & Dockrell 1994).

Within Pascoes study is a series of calculations and formulas, for measuring the angle the spine is out of line when carrying a schoolbag and are far too detailed for this dissertation.

Studies carried out by both Pascoe and the National Back Pain Association in 1997 agreed that many students carried their schoolbag over one shoulder only (Back pain, October 2004). The research carried out in this study agreed with their findings as question 12 of the questionnaire found that 61 of the 80 students surveyed, carried their schoolbag over one shoulder. Pascoes study shows that significant damage is done to the spine when walking with a schoolbag carried over one shoulder only. This damage occurs because; the body throws itself forward to compensate for the weight carried. This problem is compounded even more if the student is carrying a heavy schoolbag far in excess of the recommended 10% of their body weight.

Both the National Back Pain association and the authors Voll and Klimt recommend that school children should lift a schoolbag of no more than 10% of their own body weight (Voll & Klimt 1977). The Irish Government adopted the same figure in the commissioned report of the Government Working Group Report 1998.

However there has been no conclusive study or research carried out to concur with this figure of 10% ratio of schoolbag to body weight.

2.6 Health & Safety

As research has shown back problems are usually associated with only the adult population and this is confirmed in reports published yearly by the

Health & Safety Authority. In recent years, of the 100% of accidents in a given year, 25-30% related to Manual Handling (HSA annual reports). Manual handling was also mentioned in the working group's report (GWGR1998). However changes to our current lifestyle means that students could be lifting and carrying schoolbags that are heavier than they should be and exceed government guidelines (GWGR1998).

As stated above 25-30% of all accidents in the workplace is related to manual handling. In addition to the suffering endured by the individual, back and spine injuries cost the state €1.2 to €1.5 million per week in payments of disability and occupational injury benefits (Irish Health 2002). This study does not wish to look at this problem from a monetary point of view, as the dissertation is a health and safety issue. However, in addition to the suffering caused by back pain, there are enormous costs involved in terms of the treatment of patients. The costs also include the purchasing of special equipment to assess the damage to the back and spine. Machines that include a Magnetic Resonant Imaging (MRI) and a Computed Tomography (CAT) scan.

Michael Martin, in his position as Minister for Health, in March 2004 introduced a smoking ban in all workplaces these included pubs, restaurants and hotels. It was not a popular decision but he was determined to help people in spite of themselves. In the short-term period very little benefit will be seen, it is the long-term benefit to an individuals health and to the national health system that this smoking ban will help.

Why, can we in Ireland, not have the same legislation to protect our students? In 1996 the Minister for Education in Austria said that children should not be lifting schoolbags more than 10% of their body weight (Van Gent et al 2003; www.medscape.com 05/06/03). It is surely in society's best interest to minimise the potential danger to the children's back and spine. It would definitely be in the country's best interests to give help, where possible, to the next working generation.

The first step in giving this help was back in 1997 when the Government Working Group Report was commissioned (GWGR 1998). That was seven years ago and the Government has done nothing since. Since that report has been commissioned and published, whenever a question is raised in the Dail about the weight of schoolbags, this report is quoted as a symbol of "look what we did" to help the problem of heavy schoolbags. (25/05/2001, 19/08/2003, 26/08/2004 Dail question time)

The Government did produce literature and leaflets to be distributed to all schools and did inform all Principals of the need to be aware of the weight of schoolbags. The Government also recommended that the schools provide suitable lockers for the students. Leaflets were printed for students to read and become aware of the weight of their schoolbag (Midland Health Board 2004). But in reality what child or young adult would ever read a leaflet handed to them by the school, they would probably glance at it and shove the leaflet into their schoolbag to be hidden until they empty the bag at the end of the year. Does the literature even reach the parents and if it does reach them, is it read? It also states in the Government working report

recommendations, that parents should raise awareness of heavy schoolbags through Parents Associations and the National Parents Council.

2.7 LEGISLATION

The adult working population is covered by legislation under the Health Safety & Welfare Act 1989 (HSW 1989) and by the General Applications Act 1993 (GAA1993). There are many more government acts but to tackle the problem of lifting heavy objects the above acts are all we are concerned with at present. Manual handling is defined in part 6 of the 1993 G. A. acts as;

“ Any transporting or supporting of a load, by one or more employees, and includes lifting, putting down, pushing, pulling, carrying or moving a load which by reason of its characteristics or of unfavourable ergonomic conditions, involves risk, particularly of back injury to employees”

That definition covers every conceivable way of transporting a load but it only protects adults or those in employment. The act also covers that employees are properly trained in the act of manual handling and how to lift objects properly. However it maybe too late for some people as their back may have already been damaged by lifting heavy schoolbags (Limon et al 2004).

Under the 1989 HSW act employers have a duty of care to their employees.

Among the employers responsibility is,

- (a) Avoid manual handling where possible,
- (b) Risk reduction and assessment,

(c) Training and information to all employees.

None of this protection is afforded to students who have to lift and carry heavy schoolbags every day coming and going to school.

Manual Handling is recognised as a major problem amongst the population on a wider basis. Advice is published at every opportunity to train people properly such as in the supplement provided by The Irish Examiner newspaper (5th April 2005). If it is recognised and accepted that adults will have problems, surely it should be recognised and accepted that students will also have such problems.

Employees are protected under the 1989 and 1993 Acts (H.S.W. General Act 1993). But the pupils attending any of the secondary schools have no such legislation to protect them. It was a result of research into the legislation with regard to manual handling and the protection it offers to the adult population that prompted the researcher to ask questions in the Dail (Appendix G).

2.8 Local Representative

It was during an Internet search the researcher came across David Stanton, Teachta Dála (TD), a member of Fine Gael, and a political party that has been in opposition to the government since 1997. Mr Stanton in his role as spokesperson for education for the opposition party had raised the question of heavy schoolbags several times with different Government Education Ministers (25/05/2001, 19/08/2003, and 26/08/2004 Dáil question time). The author contacted Mr Stanton and explained the research study that was being

conducted on the three secondary schools. He forwarded on a list of relevant information, and was always available for meetings and to answer questions.

Chapter 3

METHODOLOGY

3.1 Introduction

A major part of this dissertation is from the data researched from three secondary schools in the North Cork area. The purpose of this chapter is to outline the methodology used in the study and the process by which the research was carried out. It will also look at the formulation of the questionnaire, the ethical issues with regard to the weighing of the students and lastly the interviews with the two physiotherapists.

3.2 Access Issues

The author recruited three secondary schools in Fermoy, a town in North Cork. The first was St. Colemans an all male school, the second Loreto an all

female school and the third was Colaiste an Chraoibhin a mixed school of males and females. In total 80 students took part in the study, 52 students were male and 28 were female. The selection of the schools will give a balanced overall view of how 1st year secondary students lift and carry their schoolbags to school.

The three principals of the schools were approached to participate in the research study. Thankfully all three were very supportive of the study and said they would lend any assistance they could, as this subject was continually being brought up at parent/teacher meetings. The principals said that the weight of schoolbags was always in discussion with both parents and students, however it only seemed to be a talking shop, as there did not seem to be a solution to the problem.

The school principals said that the school curriculum had to be adhered to and the only way to teach the curriculum at present was by schoolbooks. They understood only too well the implications of the students carrying heavy schoolbags but what were they to do. They had complied with information and circulars sent to them by the Department of Education on providing lockers for the students (GWGR 1998).

Discussions with the principals continued after receiving their co-operation to help with the study. It was explained to them that the student would need to be first weighed without the schoolbag to get the individual's weight. It would then be needed to weigh the individual student carrying the schoolbag to get the combined weight of the student and the schoolbag. The reason for this method was to get the clear exact weight each individual student carries to

school on a daily basis. It would also give a clear indication whether the student was lifting a heavy schoolbag. This method of weighing the students and their schoolbags brought the next dilemma.

3.3 Ethical Issues

The principals were worried as to a safe process of weighting the students, bearing in mind that some of the students might be self conscious about how heavy they are and not wanting others to know their weight. The potential for bullying could be there, if the researcher arrived with just an ordinary bathroom scales and asked the students to stand on it in front of their classroom. Problems would still arise even if the student was brought out of the classroom to a different location and then get them to stand on the bathroom scales. The researcher would then have to lean over the person to see their weight; this would be politically incorrect, especially involving young ladies.

A colleague mentioned he might have a solution. He had been in hospital recently and he had been weighed on admission. They had used a special chair that you sit on and it weighs you at the same time. The measurements are on a panel at the back of the chair where only the nurse could see what they were. After conducting a little research into this special chair it was decided by the researcher and accepted by the principals of the schools as the perfect solution to the problem. The students would sit on the chair first without the schoolbag and their weight could be recorded. They would then be given the schoolbag to hold while still sitting in the chair and that would be the total weight needed. The students would not see what weight they were and neither would anybody else.

This ensured that the measurements taken on the students own body weight and on their schoolbag would be accurate because of using an electronic weighing scale. The electronic weighing scales in conjunction with the results of a detailed questionnaire the researcher had compiled should give the author the required data needed to complete the study.

3.4 Questionnaire

The author drafted the pilot questionnaire after consulting various books, NUI Galway modules and reading other literature on the weight of schoolbags. This research was needed to gather as much information as possible to construct a questionnaire that would reveal, not only the weight of the student's schoolbag, but also how the schoolbag is carried.

The pilot study of the questionnaire was tested on six students (Appendix B). These students were in their second year of secondary school and had already experienced the rigours of their first year lifting heavy schoolbags. Three boys and three girls from different schools in the north Cork area filled in the questionnaire. The students consisted of immediate and extended family members.

These students were not weighed, nor were their schoolbags. The only purpose of the study of these students was to test their understanding of the questions within the questionnaire. They were asked to fill in the questionnaire and comment on their understanding or lack of understanding of the questions. This helped the author to research what were the right questions that should be asked to receive the necessary data needed to

complete the study. The feedback from the students and the answers to the questions showed the author that certain changes were needed to the questionnaire.

The researcher needed to change certain questions to avoid confusion and to receive the correct information; e.g. the author changed the word “sex for gender”. The questions needed numbering so the findings would be easier to explain by going through them in chronological order when analysing the results of the study. The terminology of certain questions was changed so the students would understand them. At a meeting in Cork with NUI Galway, for the one to one consultations on the dissertation, the final questionnaire was agreed and completed (Appendix E). A cover page was included to explain to the students what research they were participating (Appendix C). A permission page was also included for the parents/guardians of the students taking part in the study (Appendix D). The questions asked in the questionnaire are both quantitative and qualitative. When compiling the questionnaire the author was conscious of the age group that was being surveyed. He was also aware that it was their first year in secondary school and wanted to give the students a chance to voice their opinion. In this respect some of the questions in the questionnaire are of a qualitative format and are therefore only the student’s opinions.

Quantitative research is concerned with precise measurement and with numbers. Within the context of this study the quantitative questions dealt with various data relating to age, individual weight, schoolbag weight, distance

walked, gender. The full analysis of the study will be covered in more detail in the methodology section of this dissertation.

Qualitative research is concerned with careful description, judgement and interpretation. It is concerned with how people understand their own lives.

(Page 10 Module Practical Research & Writing NUI Galway)

There are three qualitative questions composed within this study to give the students a chance to voice their own opinions. It is hoped that the students have been honest when filling in the questionnaire and in the author's judgement they were honest. The talk and the enthusiasm in the classroom when conducting the questionnaire gives the researcher the impression that the students were trying to make a difference. The students in the three schools were united in their hope that they were having a voice in their own future. It was explained to each class, that no change to the weight of their schoolbags could or would be envisaged within the immediate future. Their help however would be invaluable in putting together a recognised study conducted on secondary school students because no other study seems to be conducted in this country. *The authors are not aware of any published survey documenting the loads that are carried by children to and from school* (Casey and Dockrell, 1996).

3.5 Guidelines

A Government working group report into the weight of children's schoolbags agreed that children/students should only be carrying 10% of their own body weight (GWGR1998). Within that report it is clearly stated that the weight of the schoolbag carried by the student should only be 10% or less of that

students body weight. It also stated that based on average weights for males and females, the weight limit for 12-year-old students should be 3.7 kilograms (kg). It further stated that for 17-year-old students, that a weight limit should be imposed of 5.5kg for females and 6.2kg for males.

This is the reason why the students needed to be weighed separately from their schoolbag to calculate the weight of the schoolbags that the students were lifting and if they were too heavy. After reading the Government working group report 1998, the figure of 10% is mentioned and this figure is also mentioned in other reports this author researched in the course of this study (Voll & Klimt 1977). However, this researcher could find no mention or information, which showed a study or research, conclusively stating that students lifting 10% of their body weight was acceptable. The phrasing of the following sentence is part of the executive summary of the Government working group report. *“There appears to be a consensus that 10% of body weight is reasonable for children to carry.”* This matter of the 10% body to schoolbag ratio was raised in the interviews with the physiotherapists.

3.6 Interview with Physiotherapists

The researcher met the Cork physiotherapist in their clinic and had a small list of questions prepared. As the interview was being conducted using quantitative questions much would depend on the answers to the questions (Appendix J). The answer to one question could lead the researcher to seek answers down a different path to the original route. The physiotherapist said that they had seen a marked increase in the number of school going children

attending the clinic. The most common ailment or complaint that the children suffered was of the Sacroiliac joint.

This joint is in the hip area it lies between the sacrum and the ilium (hip bone) and the common cause or reason for having this ailment is from lifting heavy objects from the ground to the shoulder. An example can be of a student lifting a heavy schoolbag from the ground and throwing it over one shoulder. The joint is also under constant pressure when the student is walking, as they tend to bend the spine backwards to compensate for more weight in the front or the side (Pascoe et al 1997; Kennedy et al 1997). While there were no exact figures to collaborate the theory the physiotherapist said that in their opinion there were more young people showing up at the clinic with the back complaint and a major contributing factor was the heavy schoolbags.

The physiotherapist stated that it is a medically proven fact that 60% of a person's body weight is from the waist up. By leaning over to pick up the heavy schoolbag plus the added 60% body weight puts massive strain on the lower back and spine. The lifting of a weight of 25 kg puts a pressure on the spine corresponding to 250 kg (Eva Norgaard, Logitrans).

Carrying the schoolbag over one shoulder then increases the strain on the back (Pascoe et al 1997). This results in damage to muscles, ligaments, tendons or discs. The author had already completed his visit to the three schools and had weighed all the students. At the time of the interview the research was not broken down to the graphs and charts as they appear in this dissertation. The percentages were worked out and were discussed with the physiotherapist. It came into the discussion about the 10% ratio between body weight and schoolbag weight. The physiotherapist said that just

because a student weighed heavy that did not mean that they were necessarily stronger or fitter

During the interview the discussion turned to ways to help the students to avoid back problems. A couple of solutions came to the forefront straight away. The students should be trained not to lift the schoolbag from the ground to their shoulder. The schoolbag should be lifted in two stages, from ground to bench/table and then from bench to shoulder. The schoolbag should be worn over two shoulders and should have a belt around the waist to pull the bag tight to the spine (Kennedy et al 1997). This helps to keep the upper body/torso upright and helps to maintain proper posture when carrying and walking with the schoolbag. The researcher posed the question of the use of trolley bags similar to those used by air stewards pulling the bag on wheels. The physiotherapist said this idea brought with it its own set of problems. The trolley bags would have to be robust to stand the weight of the books and the terrain it would be pulled over. Plus it would still have to be lifted if the student had to climb steps. The researcher posed the question had any studies been carried out, by the Irish Physiotherapy Society, into these complaints. The physiotherapist advised me to contact Sara Dockrell, as she was a leading figure in the study of back problems and schoolbags.

Interview with Sara Dockrell

As a result of this information the author contacted and met with Sara Dockrell, in St James Hospital in Dublin. Ms Dockrell is a Lecturer at the School of Physiotherapy, with Trinity College Dublin and was a member of the Governments working group report committee, which researched and

compiled the working group survey into the weight of children's schoolbags. We discussed the findings of the interview I had with the Cork physiotherapist. Ms. Dockrell agreed with most of the findings except she could not comment on the increased figure of children seeking help for back problems. The reason for this is, Ms Dockrell does not conduct a clinic on a day-to-day basis. It would not be possible for her to comment on the increase without conducting a study. However she did give the author a copy of her report on the study on 10-year-old primary school pupils and the weight of their schoolbags. Ms Dockrell also passed on other information mentioned and referenced in this dissertation.

In the course of our meeting I asked Ms Dockrell where did the 10% figure for the ratio between the students body weight and the weight of the school bag being carried, come from? In the course of my research I had not come across any relevant information.

Ms Dockrell said that she did not know where the figure had originated from and that it was only being used as a guideline. However, she did mention that the figure of 10% was now being called into question as to whether it was an accurate guideline to be using as other studies were now showing a worrying trend. These latest studies were only conducted on primary schoolchildren and, although the studies are in their early stages, it showed that the schoolchildren are lifting schoolbags far heavier than that of the 10% guideline figure (Casey & Dockrell, *Journal Physiotherapy Ireland*, Vol. 17 No.2).

As a result of the research carried out by this researcher there was only one reference to a 10% ratio for schoolchildren. In 1996, the then Austrian

Education Minister said that school children should only lift 10% of their body weight (www.medscape.com).

3.7 School Talk

A talk sponsored by the Parents Association of Loreto, the all-female school, was given by a local physiotherapist.

The talk was titled '*Walk Right, Sit Right, Stay Right*'. Physiotherapist Sally Ann Quirke gave the talk, on Monday 24th January 2005. The author attended the talk, as part of research to see if anything Ms. Quirke said during her presentation that could contribute to this study.

The talk was not just about the weight of the school bag but covered a variety of subjects. This revealed wearing high shoes, which throws the body forward when walking, in addition, a schoolbag over one shoulder has an effect on posture (Pascoe et al 1997). However, holding oneself upright while both walking and sitting has some effect but a lot depends on fitness as to the span of effect on one's posture (Health Promotion Unit 2003).

The author had a short meeting with Sally Ann Quirke after the talk and explained the study and research that was being undertaken. Unfortunately, she had no facts or figure to contribute to this study.

Overall, the talk was informative and could be recommend that such a presentation should be given as part of the induction day course to first year students on the day they enter the school.

3.9 Dáil Questions

As previously stated in the literature review, the author met and spoke several times with David Stanton (TD) as part of the research study. Mr. Stanton was happy to oblige in raising questions in the Dáil (government) as part of the research of the study (Appendix G).

In the wake of tribunals for such cases as army deafness claims, industrial & orphanage school claims, and just recently, the claims about patients being wrongly charged in the nursing homes charges affair. A question, that if at some stage in the future if it is proven that carrying heavy schoolbags does damage your back, who would be responsible, the Government or the schools? More to the point will the taxpayer, end up footing the compensation bill as has already happened on previous occasions. These questions came about as a result of certain findings from the research with the schools. Four questions were asked of the Minister for Education and Science, Mary Hanafin through David Stanton (TD) (Appendix G). The responses to that question and the others from the Minister for Education were received through Mr. Stanton (Appendix H).

Chapter 4

PRESENTATION of RESULTS & FINDINGS

4.1 INTRODUCTION

This is an introduction to the analysis of the results and findings of the research that was carried out on the students. The questionnaire is designed in three formats, (1) Unnumbered questions. (2) Numbered qualitative questions concerning precise measurements and numbers. (3) Numbered quantitative questions, which deals with student's opinions, judgement and interpretation.

4.2 SUBJECT MATTER

The first three questions unnumbered at the start of the questionnaire were designed to introduce the students gently into the research. The first question told me which school was participating in the study. The name of the school in two cases told me the gender of the students, be it all male and all female schools. It was necessary to include the gender question when dealing with the third school to distinguish between the male and female students. The question was also essential to discover the exact number of male and female students participating in the research. Within the charts some of the findings are broken down by the genders.

The next question is to discover the age of the students taking part and to categorise the male and female students into their age groups.

The author filled in the last unnumbered question when the students were being weighed. This was the exact weight of the individual pupil and their schoolbag. The student was not told their body weight only the weight of their schoolbag.

There is a detailed analysis of the three schools before the numbered questions. This research is divided and subdivided between the three schools involved and is concentrated on age, gender, body weight and the weight of the schoolbag. The following charts, graphs and pie charts will show that each school was categorised individually and the three schools collectively. The charts will also show that each pupil is categorised by their gender, age, their body weight, and their schoolbag weight. The graphs will show the percentage that students are lifting above the recommended guidelines. The research and charts clearly shows the exact weight each individual student is carrying to school. It also clearly shows how much above the recommended guideline limits the weight the students are lifting.

There is a calculation and charts detailing the average weight of the students of each school. There is a calculation and chart detailing the average weight of the students of the combined schools.

The first six charts are dealing with the unnumbered questions and their relationship to the students. The next group of graphs and charts are the

numbered questions and are dealt in chronological order and will be clearly marked at the top of the page.

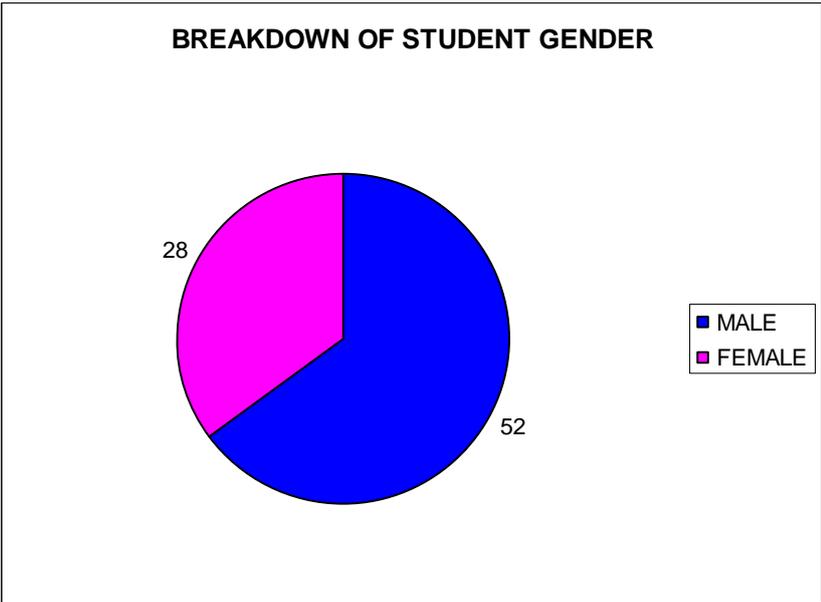
4.3 INTRODUCTION QUESTION:

THE STUDENTS GENDER? Male/Female?

The purpose of this question is self explanatory but is necessary to give a clear indication on the variation of loads being carried by both genders as well as a break down within the mixed sample school as to whether there is a bias on either gender carrying the greater load. In addition it give a clearer view as to whether males are more likely to carry a greater load than females.

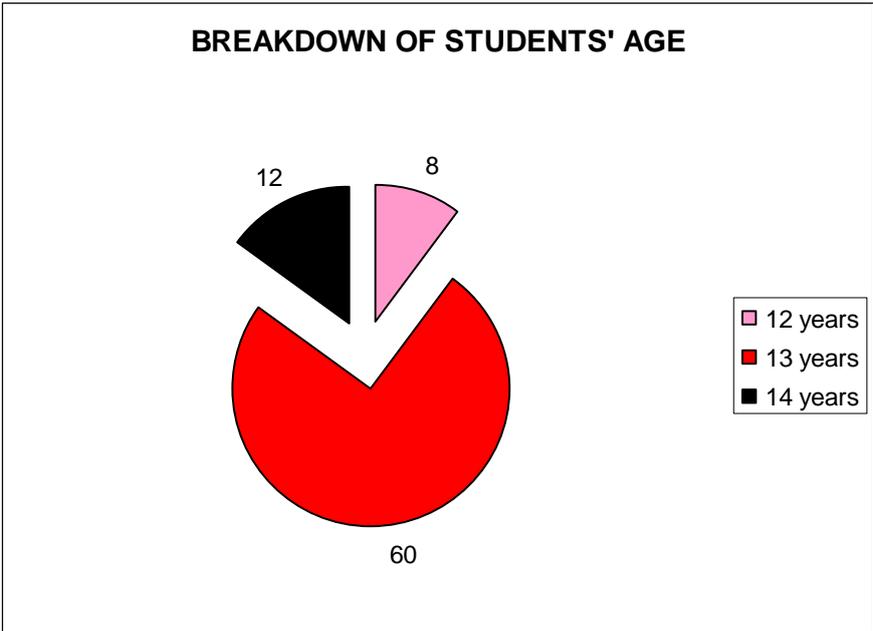
Of the eighty students who contributed, fifty-two were male and twenty-eight were female, giving a 1.89:1 ratio of males to females. This will hopefully give us a clearer scenario as to differences between the schools as well as the genders.

<u>Gender of Student</u>	<u>Number of Students</u>
MALE	52
FEMALE	28



INTRODUCTION QUESTION : THE STUDENT'S AGE IN YEARS?

This question was posed as to evaluate which age group is carrying the greatest load in relation to their body weight.



The total amount of students interviewed was eighty of which,

- Twelve students were 12 years of age,
- Sixty students were 13 years and
- Eight students were 14 years of age.

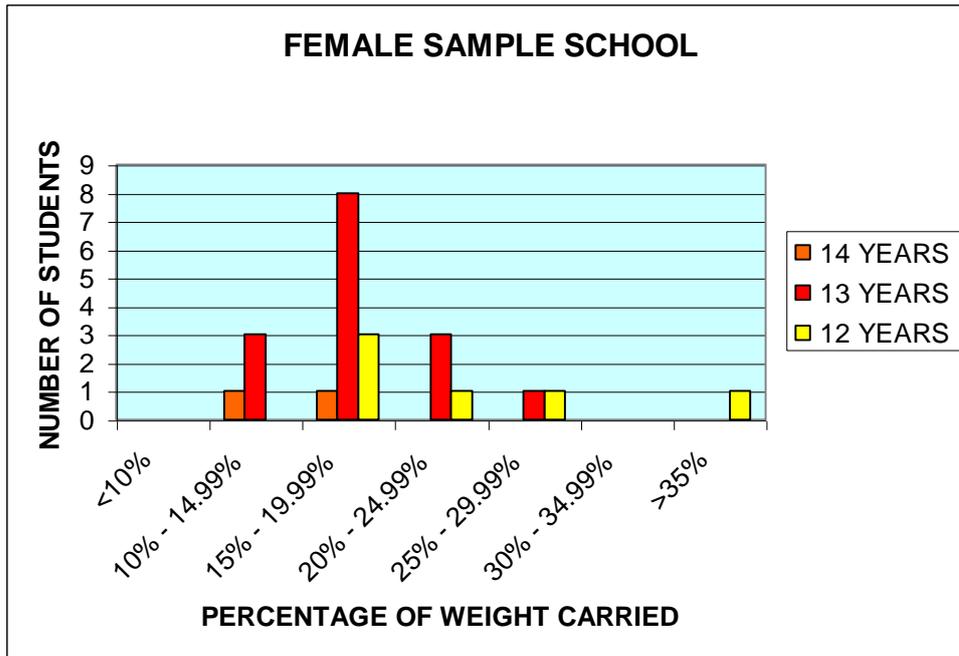
The evaluation of this chart shows that of the 80 students surveyed,

- 75% were 13 years old,
- 15% were 12 years old,
- 10% were 14 years old.

FEMALE SAMPLE SCHOOL

TOTAL AMOUNT OF FEMALE STUDENTS => 23

<u>Students' Age</u>	<u>Percentage of Weight Carried</u>	<u>Number of Students</u>
12 YEARS	LESS THAN 10%	0
	10% TO 14.99%	0
	15% TO 19.99%	3
	20% TO 24.99%	1
	25% TO 29.99%	1
	30% TO 34.99%	0
	35% OR MORE	1
13 YEARS	LESS THAN 10%	0
	10% TO 14.99%	3
	15% TO 19.99%	8
	20% TO 24.99%	3
	25% TO 29.99%	1
	30% TO 34.99%	0
	35% OR MORE	0
14 YEARS	LESS THAN 10%	0
	10% TO 14.99%	1
	15% TO 19.99%	1
	20% TO 24.99%	0
	25% TO 29.99%	0
	30% TO 34.99%	0
	35% OR MORE	0



MALE SAMPLE SCHOOL

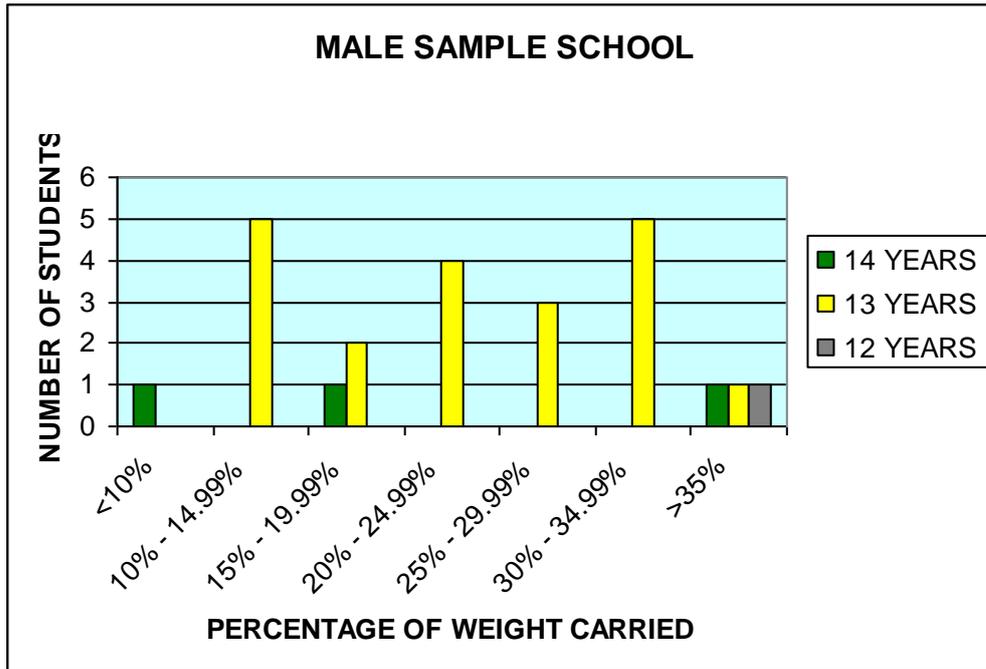
TOTAL AMOUNT OF MALE STUDENTS => 24

Students' Age Percentage of Weight Carried Number of Students

12 YEARS	LESS THAN 10%	0
	10% TO 14.99%	0
	15% TO 19.99%	0
	20% TO 24.99%	0
	25% TO 29.99%	0
	30% TO 34.99%	0
	35% OR MORE	1

13 YEARS	LESS THAN 10%	0
	10% TO 14.99%	5
	15% TO 19.99%	2
	20% TO 24.99%	4
	25% TO 29.99%	3
	30% TO 34.99%	5
	35% OR MORE	1

14 YEARS	LESS THAN 10%	1
	10% TO 14.99%	0
	15% TO 19.99%	1
	20% TO 24.99%	0
	25% TO 29.99%	0
	30% TO 34.99%	0
	35% OR MORE	1



MIXED SAMPLE SCHOOL

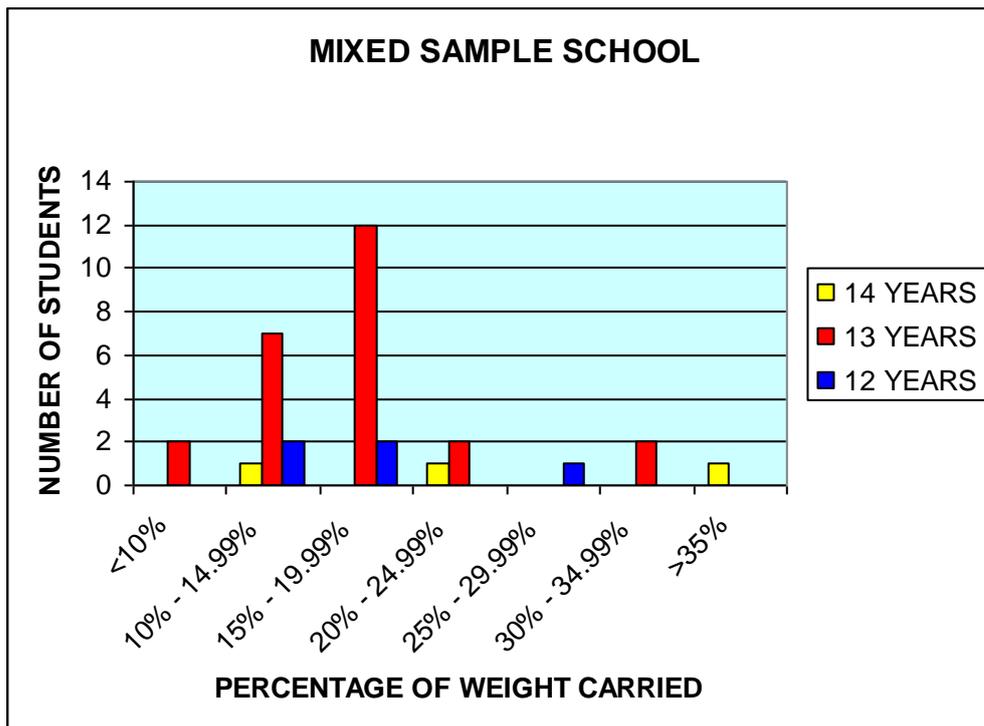
TOTAL AMOUNT OF STUDENTS => 33

Students' Age Percentage of Weight Carried Number of Students

12 YEARS	LESS THAN 10%	0
	10% TO 14.99%	2
	15% TO 19.99%	2
	20% TO 24.99%	0
	25% TO 29.99%	1
	30% TO 34.99%	0
	35% OR MORE	0

13 YEARS	LESS THAN 10%	2
	10% TO 14.99%	7
	15% TO 19.99%	12
	20% TO 24.99%	2
	25% TO 29.99%	0
	30% TO 34.99%	2
	35% OR MORE	0

14 YEARS	LESS THAN 10%	0
	10% TO 14.99%	1
	15% TO 19.99%	0
	20% TO 24.99%	1
	25% TO 29.99%	0
	30% TO 34.99%	0
	35% OR MORE	1



TOTAL OF THREE SAMPLE SCHOOLS

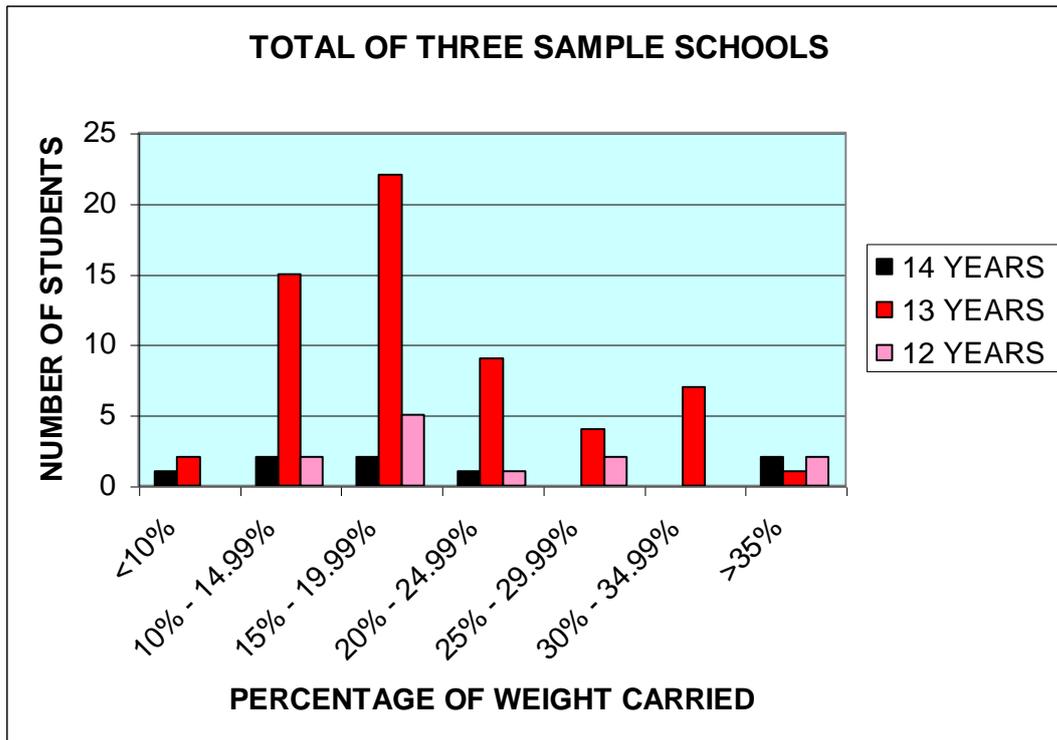
TOTAL AMOUNT OF STUDENTS => 80

Students' Age Percentage of Weight Carried Number of Students

12 YEARS	LESS THAN 10%	0
	10% TO 14.99%	2
	15% TO 19.99%	5
	20% TO 24.99%	1
	25% TO 29.99%	2
	30% TO 34.99%	0
	35% OR MORE	2

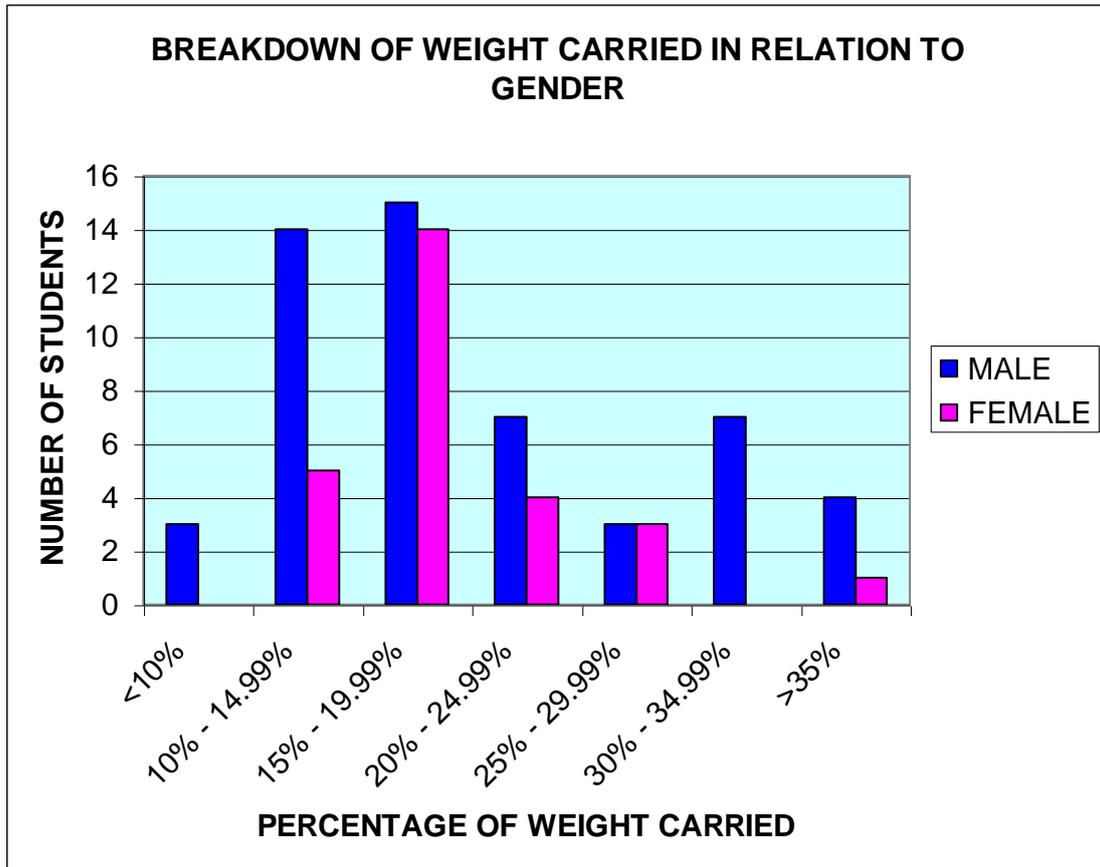
13 YEARS	LESS THAN 10%	2
	10% TO 14.99%	15
	15% TO 19.99%	22
	20% TO 24.99%	9
	25% TO 29.99%	4
	30% TO 34.99%	7
	35% OR MORE	1

14 YEARS	LESS THAN 10%	1
	10% TO 14.99%	2
	15% TO 19.99%	2
	20% TO 24.99%	1
	25% TO 29.99%	0
	30% TO 34.99%	0

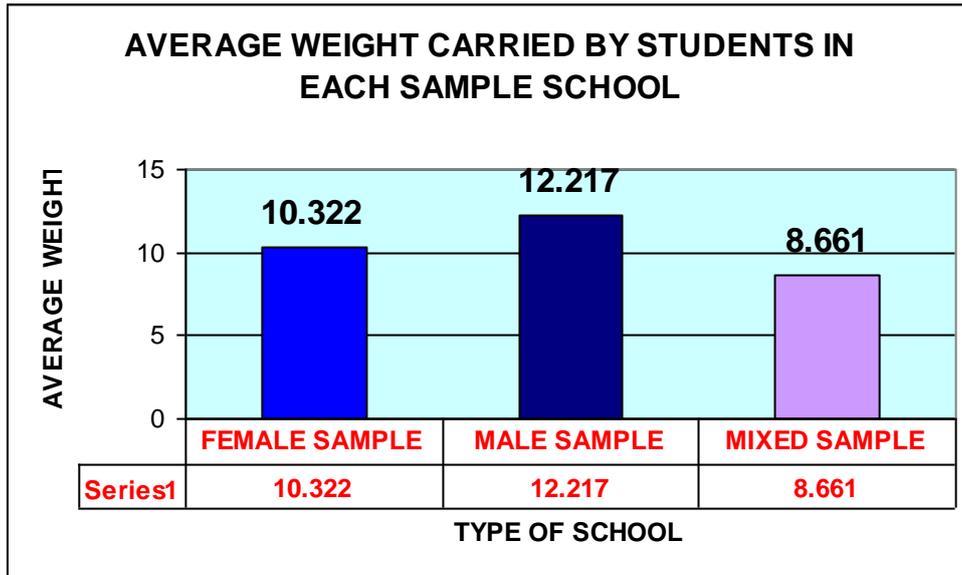


BREAKDOWN OF WEIGHT CARRIED IN RELATION TO GENDER

<u>Percentage of Weight Carried</u>	<u>Male</u>	<u>Female</u>
LESS THAN 10%	3	0
10% TO 14.99%	14	5
15% TO 19.99%	14	15
20% TO 24.99%	7	4
25% TO 29.99%	3	3
30% TO 34.99%	7	0
35% OR MORE	4	1



THE AVERAGE WEIGHT BEING CARRIED BY STUDENTS.



The above graph gives a breakdown of the average weight being carried by the students.

Female Sample School	10.322 kg
Male Sample School	12.217 kg
Mixed Sample School	8.661 kg

The evaluation of all the charts shows that 75% of the students that took part in the survey were 13 years of age. Among this group it was noted that out of the 60 students interviewed 37 of them carried between 10% and 20% of their body weight on their back.

In addition, the 12 students that were 12 years of age, 7 of them carried a weight within this range also. The three female students were all attending the female sample school and what was surprising for the author was that the three were carrying in and around the class average, at 7.8kg, 10.1kg and 11.2kg respectfully.

The result discovered was that out of the eighty students who participated, only three students were lifting a load less than 10% as recommended by the Government Working Group Report (GWGR1998). Not one student within the 12-year age group was lifting the recommended load weight and only two of the sixty interviewed 13-year-olds were carrying a load of 10% or less.

The average weight being carried by each age group is as follows:

12 years	11.825KG
13 years	10.147KG
14 years	10.388KG

As already highlighted in the introduction to this dissertation it clearly states in the Government Working Group Report 1998, the recommended guideline weight for students was,

12 years	3.7kg
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It also recommended weight limits between males and females of

17year old male	6.2kg
17 year old female	5.5kg

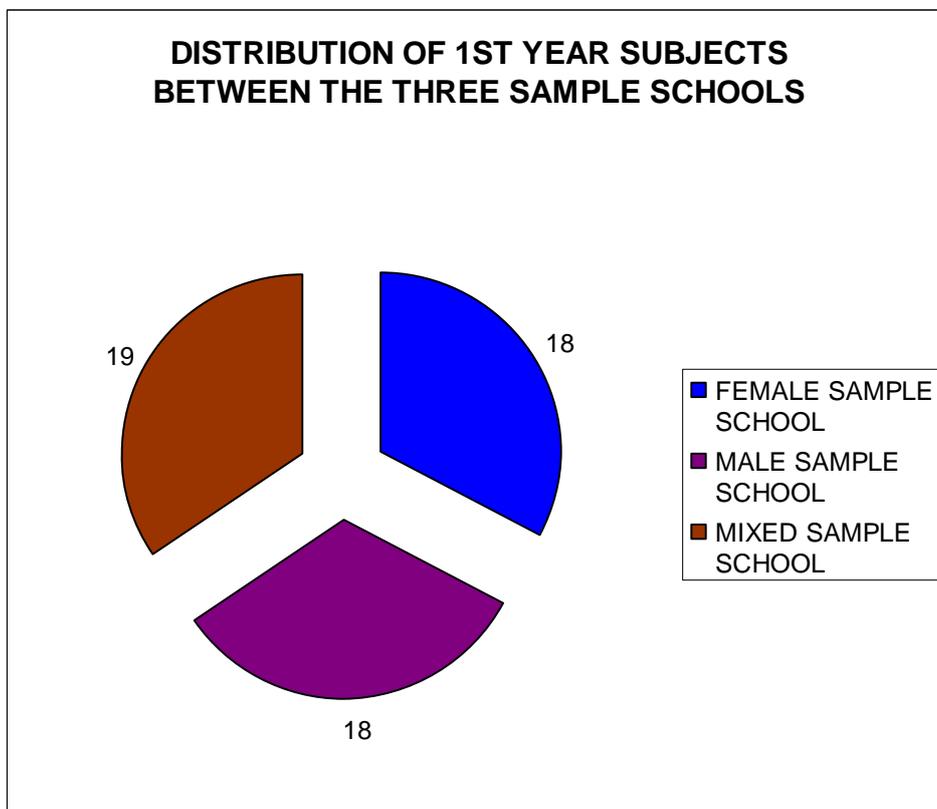
It can be clearly seen from the breakdown of the above graphs that the students are lifting and carrying schoolbags that far exceed the weights recommended in the GWGR report.

4.4 Numbered Questions

QUESTION 1: HOW MANY SUBJECTS ARE YOU STUDYING AT

PRESENT?

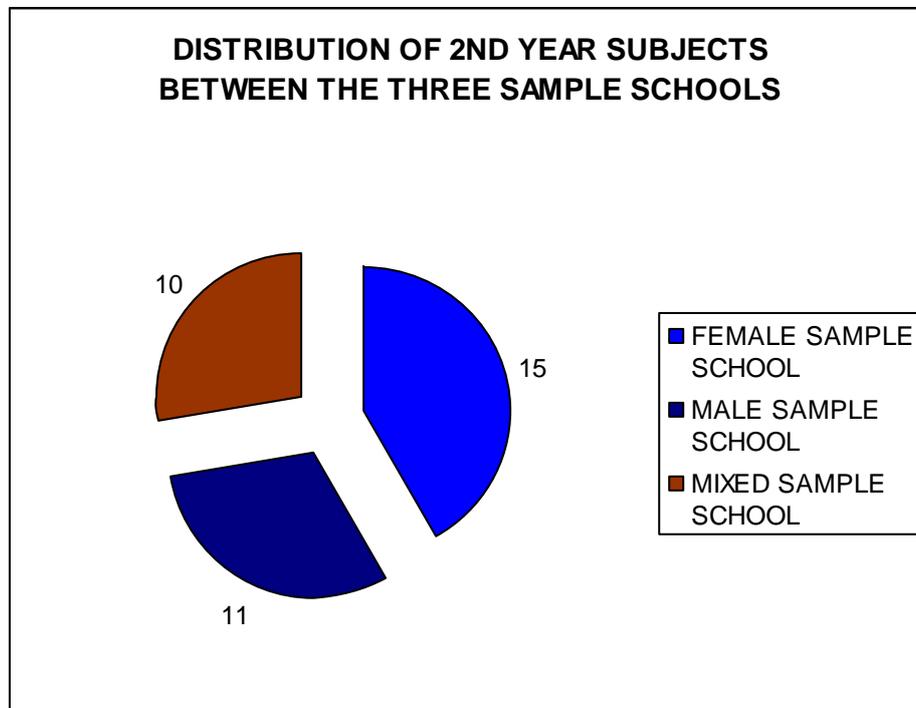
<u>Type of School</u>	<u>Number of Subjects</u>
FEMALE SAMPLE SCHOOL	18
MALE SAMPLE SCHOOL	18
MIXED SAMPLE SCHOOL	19



From the graph above it is clearly apparent that there is an even workload taken on board by all three-sample secondary schools in the students' first year. The two single-sex schools have an eighteen-subject curriculum, with the mixed school having an additional subject to give nineteen first year subjects

QUESTION 2: HOW MANY SUBJECTS WILL YOU BE STUDYING IN YOUR SECOND YEAR?

<u>Type of School</u>	<u>Number of Subjects</u>
FEMALE SAMPLE SCHOOL	15
MALE SAMPLE SCHOOL	11
MIXED SAMPLE SCHOOL	10



In the second question it becomes apparent that there is some discrepancies between the three sample schools. The female sample school seems to maintain a large amount of subjects, fifteen in total, only dropping three subjects. In comparison to the mixed sample school, where students are only obliged to maintain ten subjects, showing a massive decrease of nine subjects. It can be concluded that the students in the female sample school will have only a slight reduction in the weight of their loads in comparison to

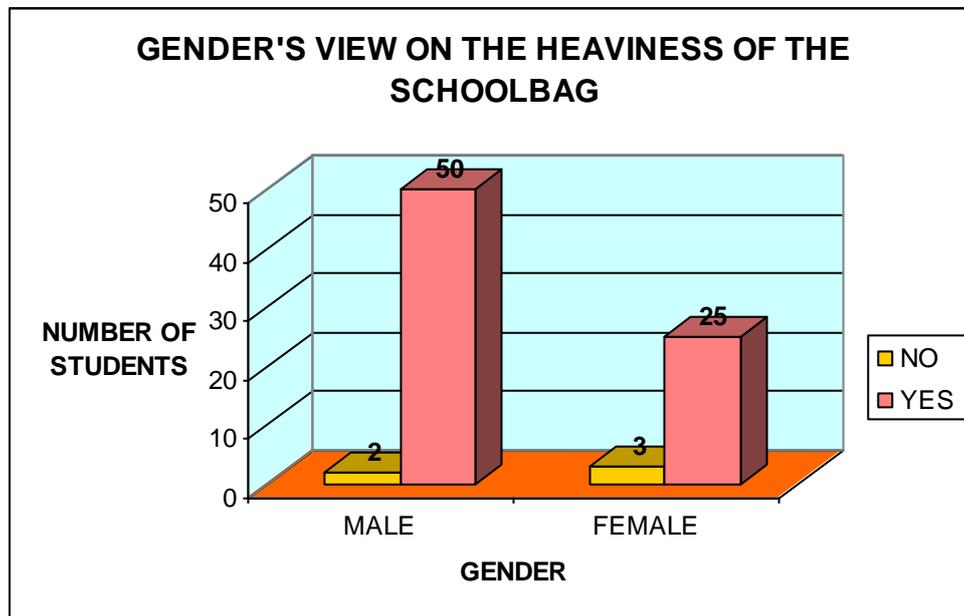
the significant reduction to the weight carried by the students in both the male sample school and the mixed sample school.

QUESTION 3: IS YOUR SCHOOL BAG HEAVY? YES/NO

<u>Answer</u>	<u>Number of Students</u>
YES	75
NO	5

EACH GENDER'S VIEW ON THE HEAVINESS OF THEIR SCHOOLBAG

<u>Answer</u>	<u>Male</u>	<u>Female</u>
YES	50	25
NO	2	3

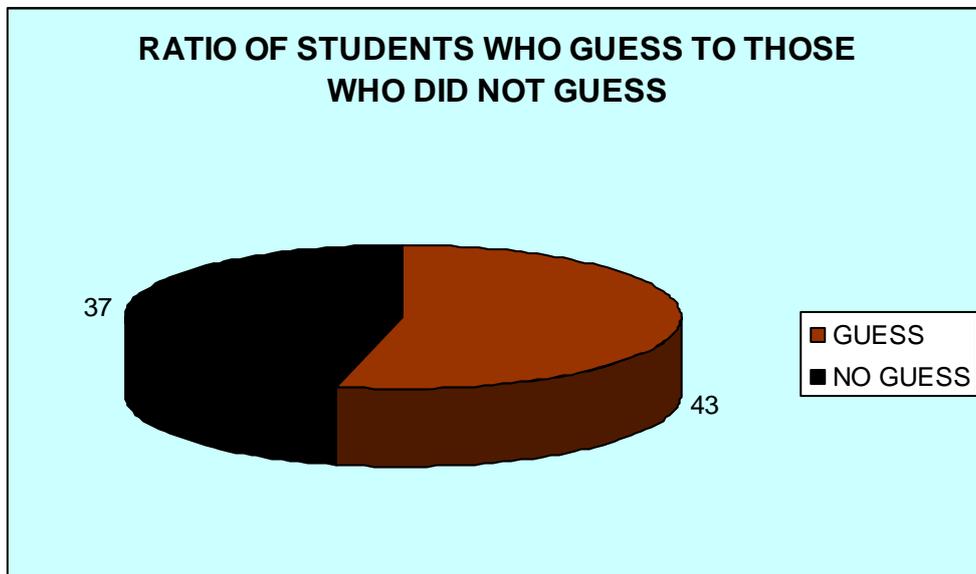


As seen in the diagram, there tends to be an even distribution between the two genders as to who thought that their school bag was not heavy. With the

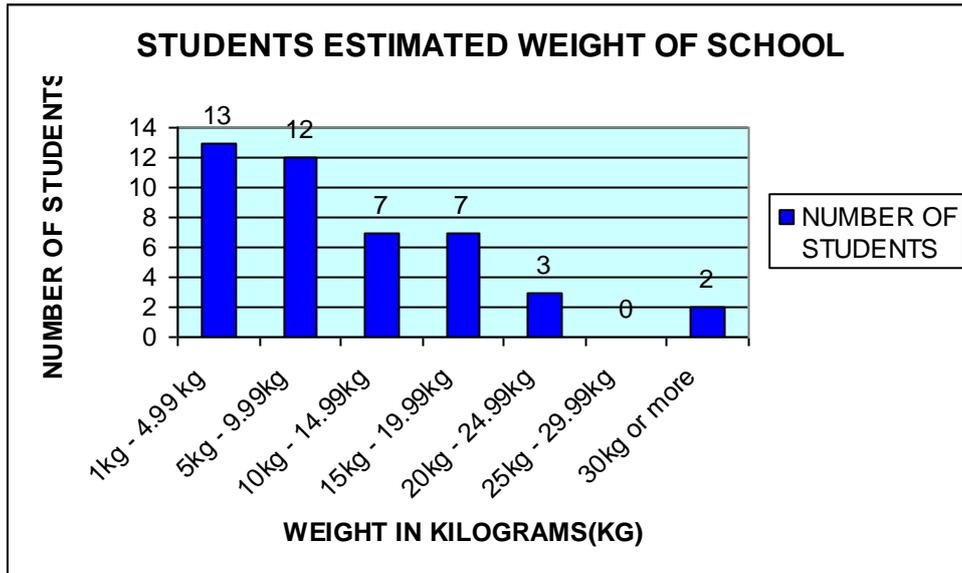
extreme difference between these few students and the majority of their peers, it may be necessary to calculate their load weight in comparison to the average of their classmates.

QUESTION 4: DO YOU KNOW HOW HEAVY IT WEIGHS?

Of the eighty students questioned in the survey, forty-three made an estimated guess, while the remaining thirty-seven did not know nor did they make a guess as to the weight of the bag they carried.



Of the forty-three that attempted a guess the following give a breakdown of the attempts made.



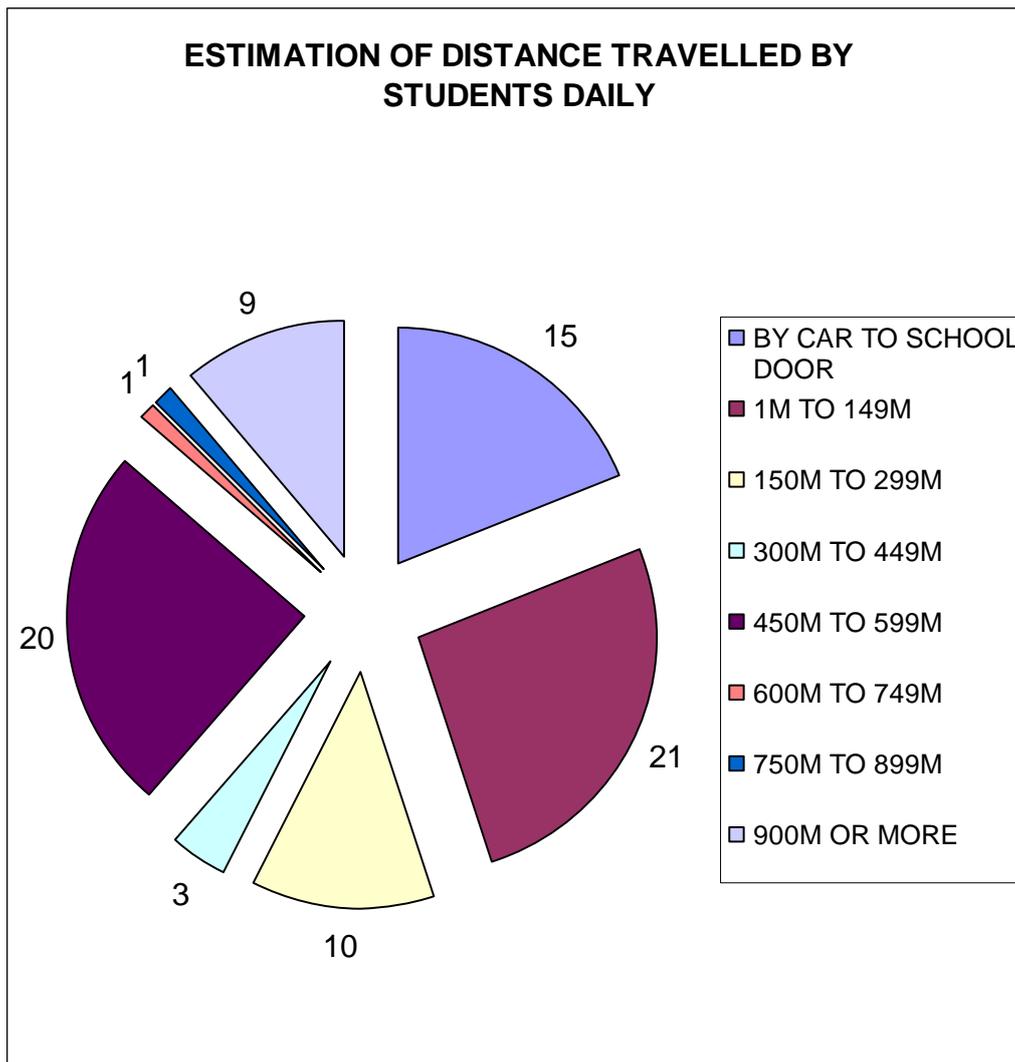
This highlights the fact that students really feel that their schoolbags are heavy and the extreme guestimates only add to this author’s conclusion that the load is indeed heavy for the students to be lifting and carrying on a daily basis. From the answers given it strengthens the theory that students are under strain with the weight of their school bags.

QUESTION 5: HOW FAR DO YOU WALK EACH DAY CARRYING YOUR SCHOOL BAG? APPROX.

This query is posed so as to estimate as to how far a student is carrying their load and to show the diversity in transporting such a load. The author estimates the further the distance travelled by foot by the student with their schoolbag, the greater the strain will be on that student's back.

The following are the varying results from the eighty students.

<u>Distance Travelled Daily</u>	<u>Number of Students</u>
1M – 149M	21
150M – 299M	10
300M – 449M	3
450M – 599M	20
600M – 749M	1
750M – 899M	1
900M or more	9
By Car to School Door	15



12% of the students surveyed are driven to the school door on a daily basis. This may be because of the weight of the school bag, many parents collect their child at the school gate. If the school bag was lighter, the students from the town would be able to walk to and from school, this would help with their fitness and would in turn free up traffic near the schools.

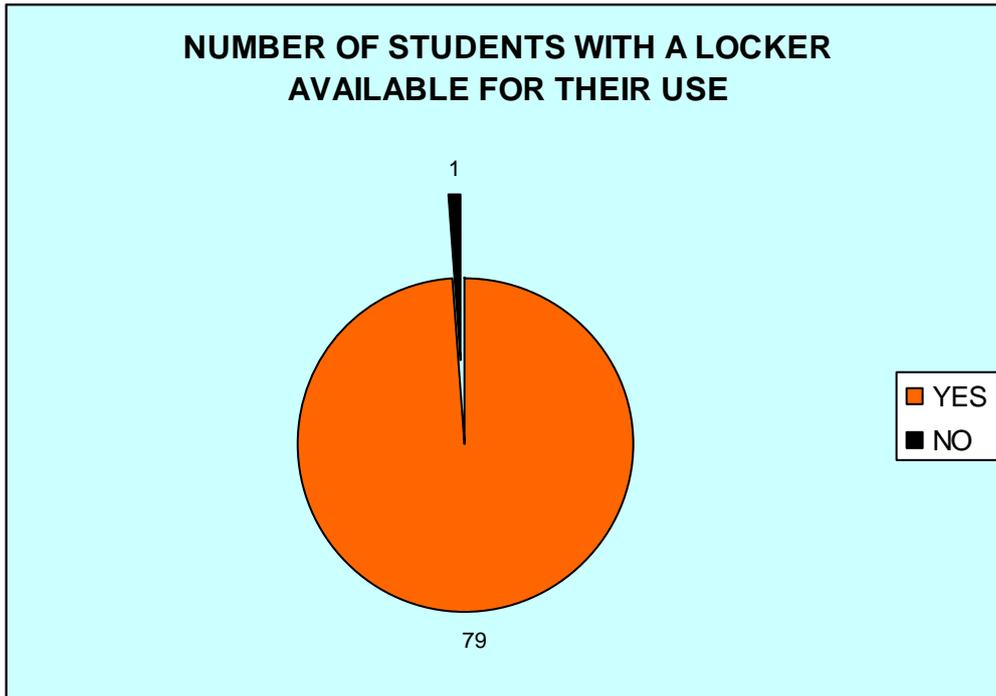
The answers to the questionnaire show that 25% of the group carried an average load of 10.4kg up to 600 metres a day. However, student's own fitness levels will determine as to the impact carrying such a weight over such a distance.

Another aspect of this result was the distance taken by over 10% of this group of students, some taking a journey of a kilometre or more. It is necessary to investigate as to the damage, if any, that occur in a young adult's body of bearing such a load on a daily basis.

QUESTION 6: DO YOU HAVE A LOCKER AT SCHOOL? YES/NO

This question is posed in order to ascertain as to means the students have in reducing the load carried in their schoolbags on a daily basis.

<u>Answer</u>	<u>Number of Students</u>
YES	79
NO	1



99% of all students have a locker available for their use, which is provided for by the management of the respective schools. The one individual who does not have a locker available for their use is not due to a management error but that of damage done rendering it beyond use. Therefore there would have been a 100% positive response to this question.

Upon the verification of this question, this author queried further into the students' use of their lockers.

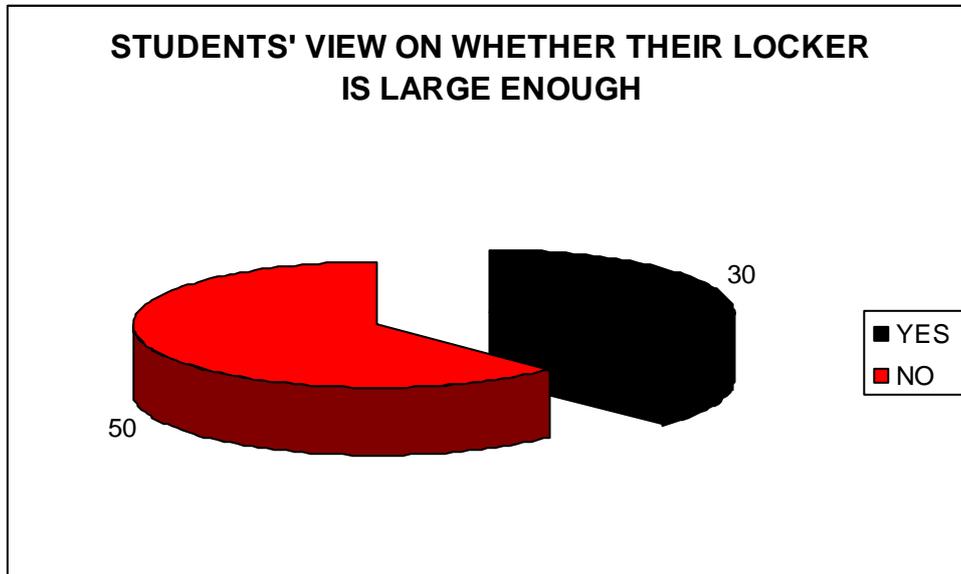
QUESTION 7: IS YOUR LOCKER BIG ENOUGH TO HOLD ALL YOUR BOOKS AND A GYM BAG? YES/NO

The purpose of this query was to see the advantages students' have from the use of their lockers, and does it have any possible effect in reducing the load being carried by the student.

Answer

Number of Students

YES	30
NO	50



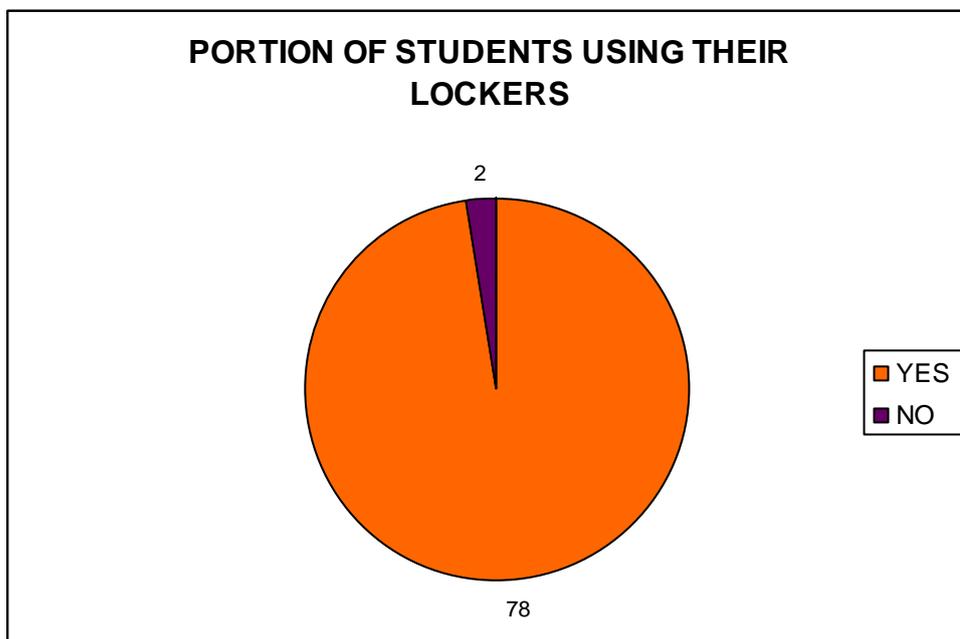
62% of the students believe that their locker is not large enough to hold the items required for their daily activities at school. This is a situation that could be resolved. Unfortunately, it is an area that is dealt with on a school basis rather than on a national scale. However, this is an aspect that could help alleviate the situation regarding the storage of students' daily equipment. If this is the case that the school locker is not sufficient in size, this author followed this situation with a query as to how many students actually make use of their locker on a daily basis.

QUESTION 8: DO YOU USE YOUR LOCKER? YES/NO

This author posed this question so as to ensure that students are making appropriate use of such a facility. If the answer to the question posed is

positive, then it makes it apparent that the student is reducing this load carried daily in comparison to those who do not avail of its presence in the school.

<u>Answer</u>	<u>Number of Students</u>
YES	78
NO	2



It would be logical for the extreme majority of students interviewed to avail of their locker. However, it did create further questions in the author's mind as to whether the student carries a greater load on occasions and does this addition have an affect on their back in comparison to the weight taken on the day of questionnaire.

QUESTION 9: PLEASE CHOOSE ONE OF THE FOLLOWING.

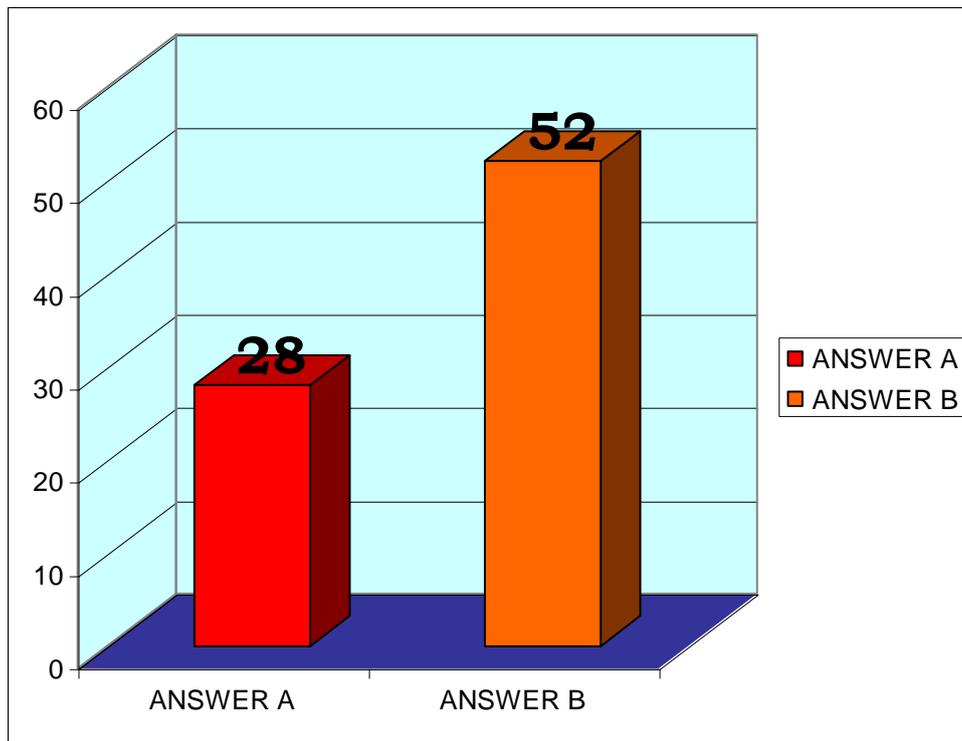
- (A) I LEAVE ALL MY SCHOOL BOOKS AT HOME AND BRING WHAT I NEED TO SCHOOL.

(B) I LEAVE ALL MY BOOKS AT SCHOOL AND ONLY BRING HOME WHAT I NEED FOR HOMEWORK

The purpose of such a query is to determine as to how many students take the option of leaving their books at home and bring in each book for the subjects of the following day. In comparison to those who avail of leaving their books at school and just carrying those required on the basis of homework.

The results of the query are as follows.

Answer (A)	28 Students
Answer (B)	52 Students

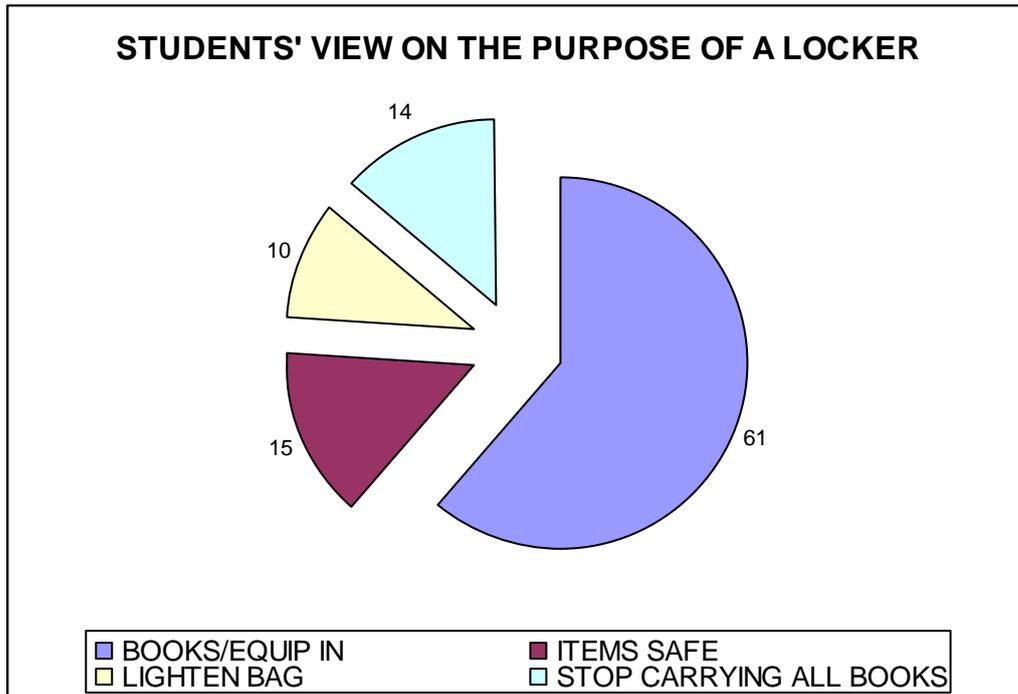


The above diagram highlights the difference between the two statements. It shows that over 60% avail of the opportunity of carrying the minimum amount of books to and from schools and hence reducing the possible weight being

carried. The maximum weight therefore depends greatly on the volume of homework rather than the amount of subjects being studied on a daily basis. Due to this query, the author estimates that there will be less stress on the students body if the second statement is adopted over the first statement, therefore reducing the probability of back strain due to the load weight carried daily.

QUESTION 10: WHY DO YOU THINK YOU HAVE A LOCKER?

The open question gives the students a chance to voice their opinion as to the use of their locker and in turn assist the author in understanding exactly as to how the students' view the purpose of a locker at school.



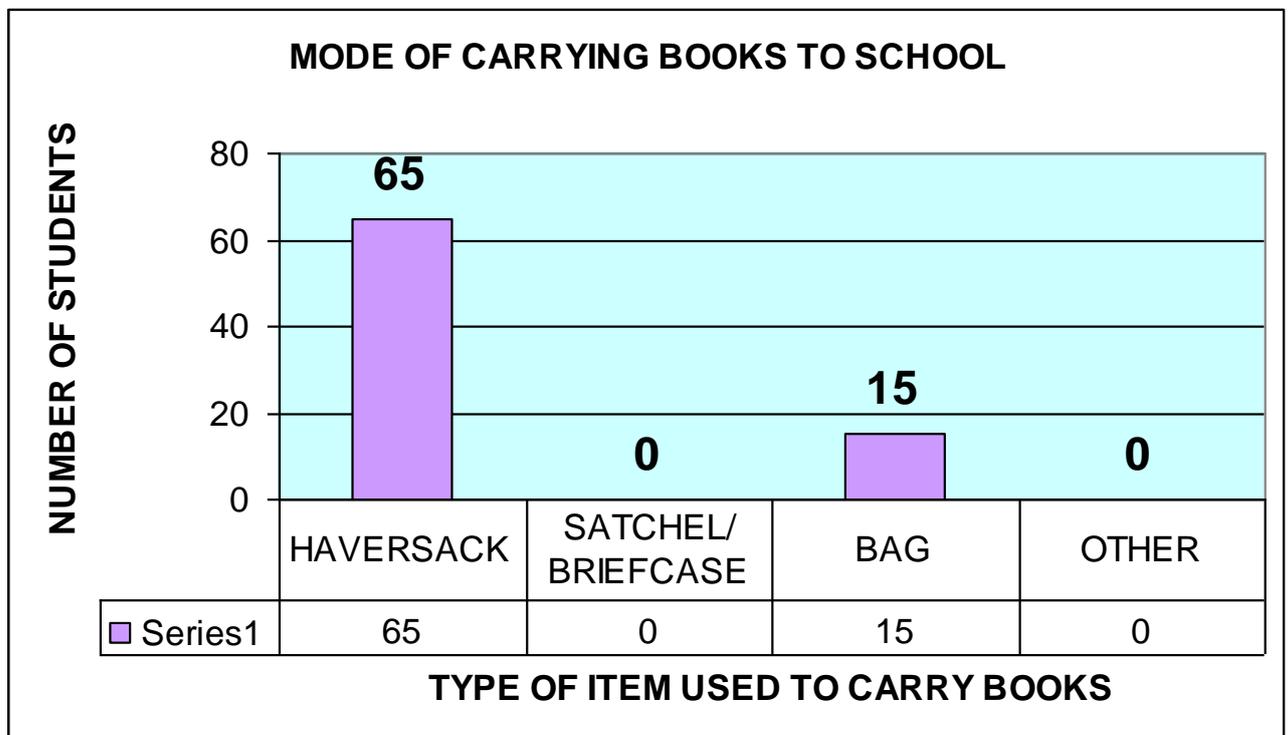
All students knew the purpose of a locker. The pie chart displays some of the responses the author received upon the asking of said question. The majority commented that they use their locker to store books and equipment for P.E. and clothing such as a jacket or jumper. Some make use out of their locker for security reasons so as to store valuable items such as personal stereos, mobile phone as well as prevention from having their books stolen. Others, however, saw it as an opportunity to lighten their schoolbag and only using it to store books during the school day when they are not in use.

QUESTION 11: HOW DO YOU CARRY YOUR BOOKS TO SCHOOL?

- (A) HAVERSACK
- (B) SATCHEL/BRIEFCASE
- (C) BAG
- (D) OTHER

By ascertaining the mode of carrying the load will assist in determining the potential strain carrying could have on a students' body. By determining the means of transporting the books, it will give a clear indication as to the weight is distributed and where the brunt of the strain will be take. Be it the shoulders, the back or the arms.

(A)	Haversack	68 Students
(B)	Satchel / Briefcase	0 Students
(C)	Bag	15 Students
(D)	Other	0 Students



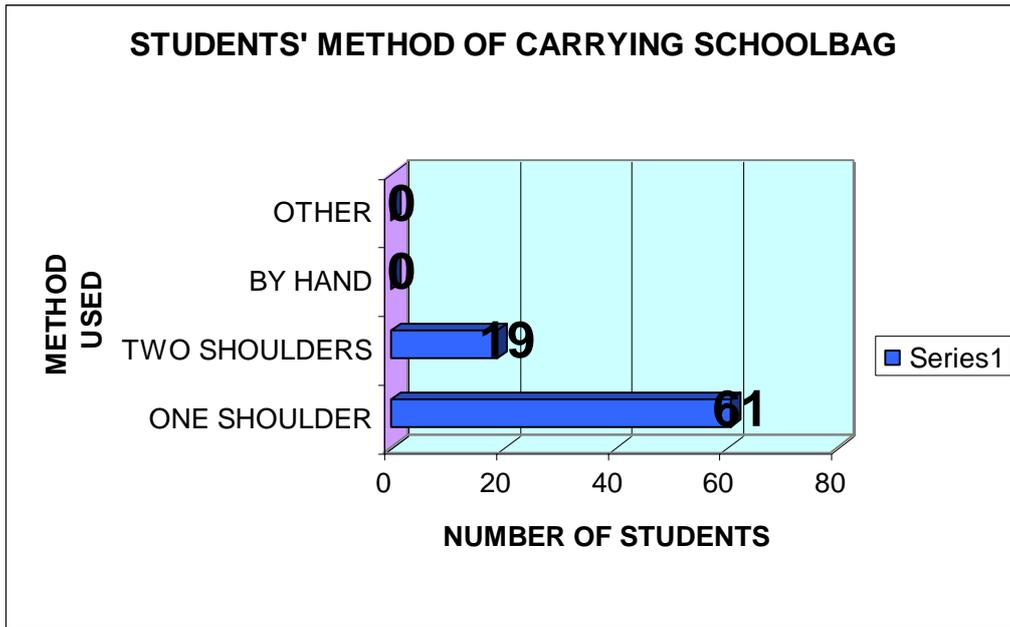
This is potentially a good result for the sixty-five students who use a haversack for the carrying of their books to and from school. In this, the haversack allows for a more even distribution of the weight of the load carried and therefore reducing the possibility of strain on the student's body. This is especially heightened when compared to the weight distribution when a briefcase or a bag carries such a load. One side of the body takes on all the weight and there is then a greater risk of strain or injury. The haversack wins out, but it is necessary to investigate as to whether these students are carrying the haversack in the correct way so as to reduce any potential problems.

QUESTION 12: HOW DO YOU USUALLY CARRY YOUR SCHOOL BAG?

IS YOUR SCHOOL BAG CARRIED OVER:

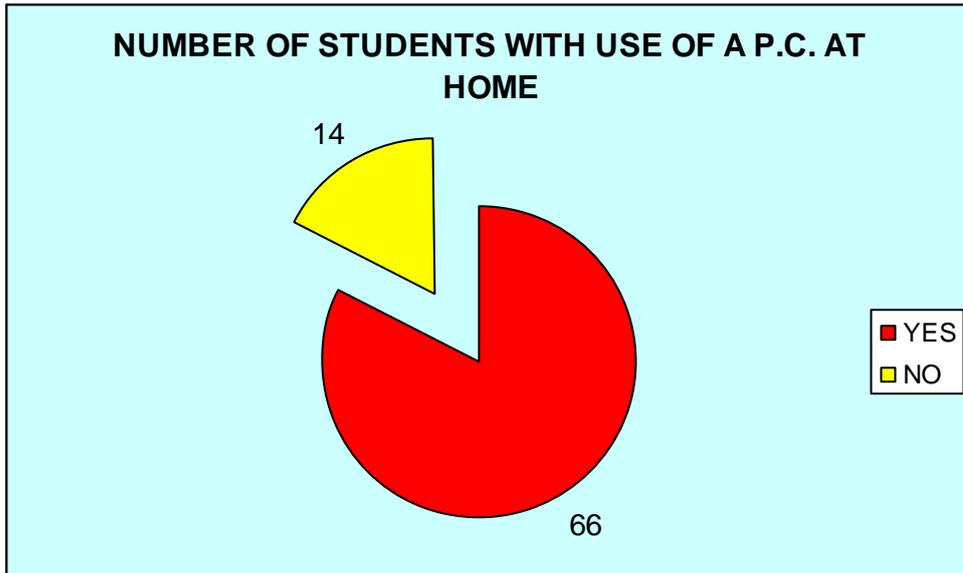
- (A) ONE SHOULDER
- (B) TWO SHOULDERS
- (C) BY HAND
- (D) OTHER

To reinforce the previous question and to expand on the subject of prevention, it is necessary to pose this question to the students in order to conclude as to the means by which the load is carried on a daily basis as well as highlighting the importance of distributing the weight in an effective manner.



QUESTION 13: DO YOU HAVE A PERSONAL COMPUTER (P.C) AT HOME? YES/NO

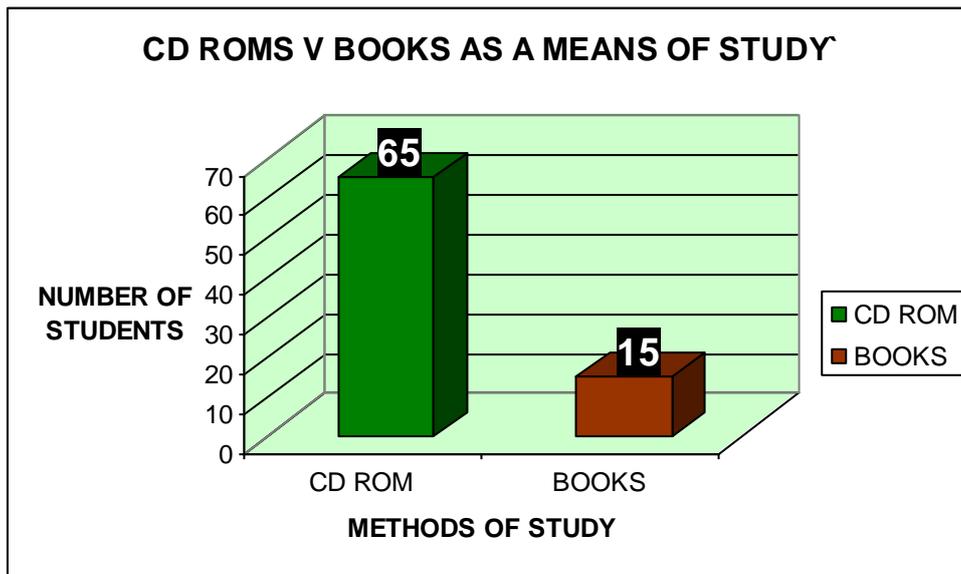
<u>Answer</u>	<u>Number of Students</u>
YES	66
NO	14



The purpose of asking this question was that it has been suggested in some circles that students could use compact disc's (CD) to study. It is suggested that this would lighten the weight of the schoolbag significantly. However as the graph shows not every student could avail of the technology. And it gives rise to the next question.

QUESTION 14: IF YOU WERE GIVEN THE CHOICE, WHICH WAY WOULD YOU PREFER TO STUDY BY, CD ROM OR BOOKS?

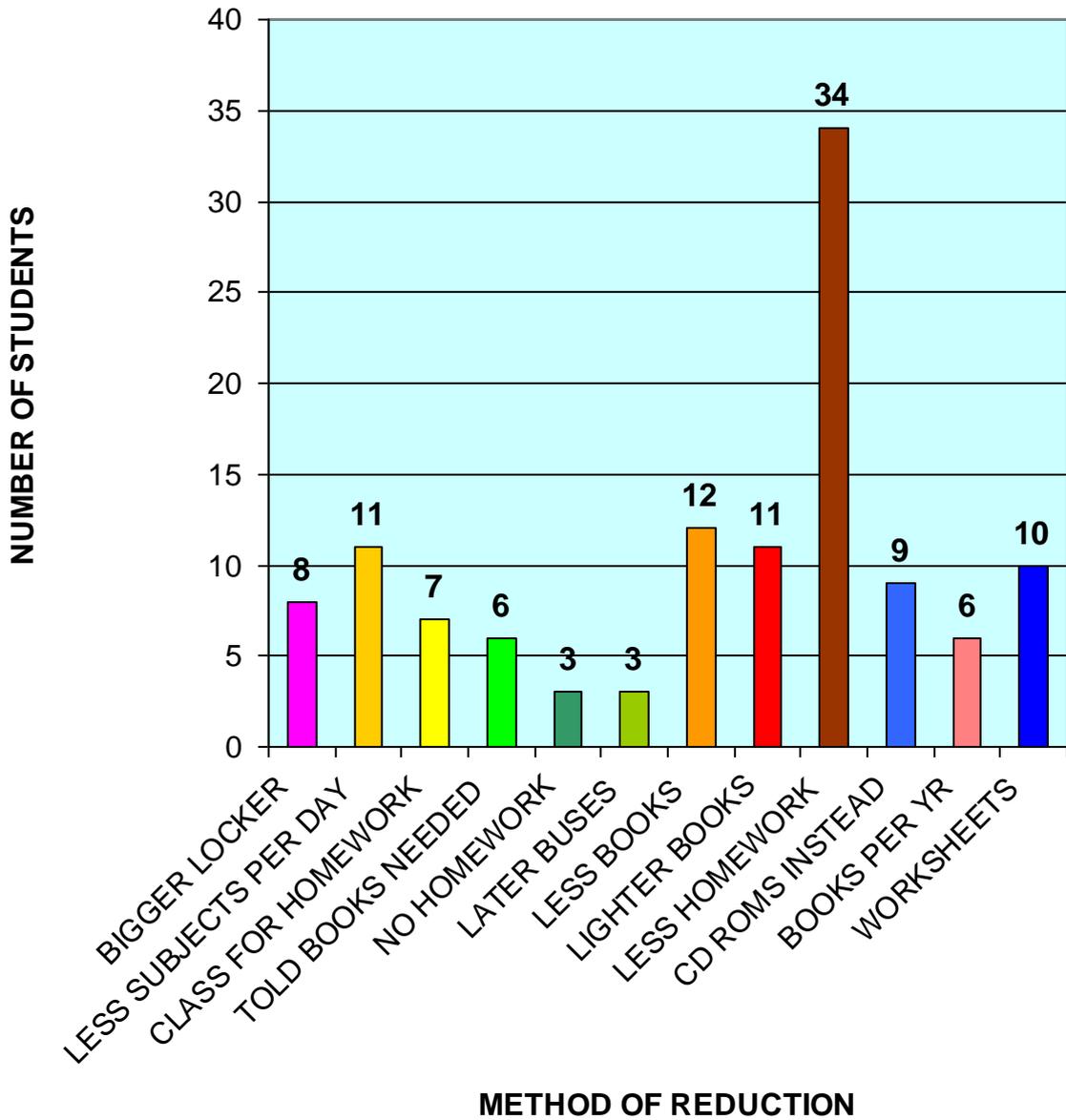
CD ROMS	65 STUDENTS
BOOKS	15 STUDENTS



This query was not to question those who only had access to a P.C. but to question all the students as to how they themselves thought would be the best method to study. The majority favoured the idea of using C.D. ROMs. However, of the 15 students that choose books, I did not distinguish as to who had access to a computer within this group.

QUESTION 15: PLEASE DESCRIBE, IN YOUR OWN WORDS, WHAT YOU THINK COULD BE DONE TO LIGHTEN YOUR SCHOOL BAG?

STUDENTS VIEW ON HOW TO LIGHTEN SCHOOL BAG



	<u>NUMBER OF STUDENTS</u>
BIGGER LOCKER	8
LESS SUBJECTS PER DAY	11
CLASS FOR HOMEWORK	7
TOLD BOOKS NEEDED	6
NO HOMEWORK	3
LATER BUSES	3
LESS BOOKS	12
LIGHTER BOOKS	11
LESS HOMEWORK	34
CD ROMS INSTEAD	9
BOOKS PER YEAR	6
WORKSHEETS	10

With regards to this question, the students were most vocal on their opinions. They were glad to suggest several methods to reduce the weight of their school bag on a daily basis.

Homework seemed to be the greatest issue. Of the eighty students questioned, forty-four of them mentioned homework in some form. Be it 'no homework', 'a class for homework', 'less homework', the students, from this particular question, believed that these solutions would greatly reduce the weight of their schoolbag.

Therefore, homework is a major contributing factor in the weight of the school bag according to the students surveyed.

4.5 Conclusion of findings

The charts and graphs of the weighing of the students, clearly shows that they are lifting and carrying schoolbags that are heavy and exceed the recommendations of the GWGR report.

On pages 39-40 of this dissertation it clearly shows the weights the students are lifting in comparison to the weights recommended in the Government Working Group Report of 1998. It also shows that there is little or no difference in the weights carried between males and females.

In the Government Report 1998, it was recommended that students be supplied with lockers and as was found in this study 100% of the students surveyed were supplied with a locker. However, though it is an advantage, this does not seem to have helped sufficiently in reducing the weight of the schoolbag. So the solution of lockers solving the problem will not work and a different avenue has to be looked at.

Chapter 5 Conclusion & Recommendations

5.1 CONCLUSION

The evidence of the research conducted in the three schools proves that the students are lifting and carrying schoolbags that are heavy and, in some cases, far exceed the recommended guidelines adopted by the Government working Group Report 1998 (GWGR 1998).

This study and the research carried out in the three schools clearly shows that none of the students were lifting schoolbags of the appropriate weight within the Government guidelines. The Government report stated that students should only be lifting a schoolbag equivalent to 10% of that students body weight (GWGR 1998). The report also stated that 12-year-old students should only be lifting a maximum of 3.7kg. The study clearly showed that schoolbags weigh far in excess of this guideline.

The long-term effect of this daily effort has the potential for back and spine injuries in the future. This research, and supported by other studies mentioned in the introduction and literature review, all agree that students health has the potential to be damaged by the weight of heavy schoolbags. However as there is no direct study or research conducted on school children and schoolbags and back pain and connecting all three to one another. It is accepted that the adult population suffers back pain, so it should be accepted that the back pain could start in the school going years.

This issue of heavy schoolbags needs to be addressed immediately so as to prevent potential damage being inflicted on the students of this country.

5.2 RECOMMENDATIONS

It is this researchers opinion, based on this study that was carried out within the three schools, that there is no immediate overall solution to the problem concerning the weight of students schoolbags. The process involves both a short-term solution and a long-term solution.

The short-term solution involves

1. The Government should immediately introduce legislation restricting the weight of student's schoolbags. This would force the publishers to look closer at the way they produce the books now and concentrate on redesigning books that are lighter.
2. The publishers should produce the curriculum in module format so the students would need only to bring the relevant chapter to school with them. This would immediately lighten the weight of the schoolbag. This method would also stop the need for books to be constantly republished and updated. The publishers would then need only to reproduce the relevant chapter with the new information included in it. An example of this would be the Tsunami disaster, all the publisher would have to do is print the relevant information and the students could just clip that into the chapter to update their records.
3. The schools should have an Induction Day for all 1st year students starting secondary school. As part of the induction, schools should

have a physiotherapist to give a talk on four items and explain the advantages and disadvantages of each item.

Manual Handling

Posture

Carrying schoolbags

Shoes

4. Students should be encouraged to buy a proper rucksack with back support and tied at the waist for the maximum support to the back and spine. The talk by the physiotherapist will show the long-term advantages of carrying heavy items over two shoulders as opposed to one. The girls should be encouraged to use the trolley bag to carry their schoolbooks. This trolley bag must be made of good quality it must also be sound and robust with an adjustable handle. The reason for this is not having an adjustable handle will only create more back and spine problems if the student is crouched over because the handle is the wrong length. If both items were made compulsory as part of the school uniform i.e. with the school colours and logo. Then students would feel part of a group and not isolated or marginalized, as every body would have the same schoolbag. The immediate long-term benefit would be that the students posture would improve because wearing a proper fitted rucksack helps pull ones upper torso into an upright position.

The Long-Term Solution

The long-term solution is not as easily solved as the short-term. It is very hard to break with the tradition of tried and trusted methods of teaching our students. The curriculum is there and at present the only sure way of teaching it is by books.

The long-term solution

1. It is this researcher's opinion, based on the study conducted, that the Government needs to conduct a working group study similar to the one in 1997. However, strict terms of reference need to be laid down as criteria for the working group to succeed. The teachers and the publishers will have a major role to play in this working group. The Government set out the criteria for what has to be learnt but it is down to individual teachers as to what books the students learn from. It is very important to have both the teachers and the publishers represented on the working group. The reasoning behind this recommendation is, the teacher's dictate which books are used in the classroom. The publishers are a commercial organisation whose sole purpose is to make money. As a result of the research carried out the feedback is that the publishers are saying they are only supplying the teachers' needs. The teachers are saying that the publishers are different and varied. The teachers also say that the style some publishers use suits some subjects and the style other publishers use suits other subjects. It is very much an individual preference on the part of the teacher.