

**AN EVALUATION OF THE EFFICACY OF HEALTH EDUCATION IN
PREVENTING SLEEP PROBLEMS IN INFANTS**

**SUSAN M KERR
BA RGN HV**

**A Thesis submitted to the University of Glasgow for the degree of MSc (Med. Sci.)
in the Faculty of Medicine (Department of Nursing and Midwifery Studies)**

© Copies of this thesis may be produced by photocopying

June 1995

ProQuest Number: 13834063

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 13834063

Published by ProQuest LLC (2019). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

Thesis
10235
Copy 1



ABSTRACT

Sleep problems in pre-school children are common. Previous studies have demonstrated that approximately 22% of nine month old infants have settling difficulties and that approximately 42% wake regularly during the night. It has been shown that disturbance to a child's sleep pattern often lasts for months, and that persistence for a year or more is not uncommon. In the pre-school years sleeping difficulties are one of the most common topics on which parents seek advice from health professionals. In the majority of cases a sleepless child causes significant stress within the family. If parents do not obtain sufficient sleep this may have a detrimental effect on their physical and emotional well-being. In a small number of cases a child who wakes frequently and will not settle back to sleep may be at risk of physical abuse. When considering causal factors the literature highlights a contradictory, uncertain situation. Sleep problems can often be helped by appropriate intervention, both behaviour modification and a psychodynamic approach have been shown to be successful forms of treatment. In recent years it has been suggested that it may be possible to prevent sleep problems developing by providing parents with advice in the post-natal period. Parents have stated that they find this type of intervention helpful, however, there has been no attempt to establish whether a preventive approach is effective.

The aim of this research was to evaluate the efficacy of health education in reducing the incidence of sleep problems. The plan was to develop a health education package that, if shown to be effective could easily be incorporated into the everyday work of health visitors. Adopting an experimental approach participants were randomly allocated to a control group or an intervention group. The independent variable, which was the parental knowledge of sleep and settling behaviour, was manipulated when the children in the intervention group were between three and four months old. The dependent variable, which was the sleeping behaviour of the infants, was assessed when the children in both groups were between eight and ten months old. Data was collected from 83 families in the control group and 86 families in the intervention group. A comprehensive analysis of the sleeping behaviour demonstrated that a significantly greater percentage of the control group had settling difficulties and night-waking difficulties than the intervention group.

It is considered that this study takes a positive initial step in evaluating whether sleep problems can be prevented. There were some threats to internal and external validity, and so the results should be treated cautiously. Recommendations are made for further research involving health visitors, and also for a longitudinal study to assess the long-term benefits of the preventive approach.

ACKNOWLEDGEMENTS

I would like to express gratitude to my supervisors Professor Lorraine Smith and Sarah Jowett of the Department of Nursing Studies, University of Glasgow for their guidance and support throughout this project.

In addition thanks must go to the following people:-

Dr. John Womersley, Consultant in Public Health Medicine, Greater Glasgow Health Board.

Arthur Jones, Acting Project Manager, Community and Mental Health Systems, Greater Glasgow Health Board.

Rachel Pollard, Information Officer, Patient Education Scotland, Health Education Board for Scotland.

Harper Gilmour, Statistician, Department of Public Health, University of Glasgow.

A number of health professionals who helped with the development of the health education booklet and the interview schedule.

I am also indebted to my husband and family for their patience and support both moral and practical throughout this entire study.

Finally, and most importantly, I would like to thank the families who took part in the study.

AUTHOR'S DECLARATION

The author declares that this thesis contains no material previously published or written by another person except where due reference is made in the text. The thesis is solely the work of the named author.

signature

CONTENTS

	<u>PAGE</u>
<u>CHAPTER ONE</u> INTRODUCTION	
1.1 Background	11
1.2 Formulating the Hypothesis	11
1.3 The Aim of the Project.....	12
<u>CHAPTER TWO</u> THE LITERATURE REVIEW	
2.1 Introduction.....	13
2.2 The Development of the Diurnal Sleep/Wake Pattern	13
2.3 The Prevalence of Sleep Problems	15
2.4 The Effects of Sleep Disturbance	16
2.5 Causal Factors.....	17
2.6 Treatment.....	22
2.7 Prevention	24
2.8 Summary	24
<u>CHAPTER THREE</u> THE RESEARCH DESIGN	
3.1 The Hypothesis	25
3.2 Summary of the Research design.....	25
3.3 The Experimental Approach	26
3.4 The Sample	29
3.5 The Intervention.....	32
3.6 The Method of Data Collection	42
3.7 Statistical Analysis.....	48
3.8 Ethical Approval	50

CHAPTER FOUR THE PILOT STUDY

4.1 Introduction.....	52
4.2 The Sample	52
4.3 The Response Rate.....	53
4.4 The Intervention.....	54
4.5 The Interview Schedule	56
4.6 Analysis of Potential Procedural Problems.....	58
4.7 Mileage/Travelling time	59

CHAPTER FIVE THE MAIN STUDY

5.1 The Sample	60
5.2 The Response Rate.....	60
5.3 The Additional Sample	61
5.4 Allocation to Groups.....	62
5.5 Letters to the Control Group.....	62
5.6 The Intervention.....	62
5.7 Data Collection	63
5.8 Statistical Analysis.....	64

CHAPTER SIX PRESENTATION OF RESULTS

6.1 The Choice of Statistical Test.....	65
6.2 The Demographic Data.....	65
6.3 The Sleep Data.....	78
Settling Behaviour	78
Night Waking.....	85
Early Waking	90
Naps	91

6.4 Parental Comments on the Booklet	98
6.5 A Comparison of the Sample to the Population	99

CHAPTER SEVEN DISCUSSION

7.1 Introduction.....	102
7.2 Summary of Results.....	102
7.3 Limitations of study	105
7.4 Discussion of Results.....	106

CHAPTER EIGHT CONCLUSIONS AND RECOMMENDATIONS 109

APPENDICES 110

REFERENCES 188

FIGURES

	<u>PAGE</u>
Figure 1 RESEARCH DESIGN.....	25
Figure 2 CHOICE OF STATISTICAL TEST.....	50
Figure 3 MATERNAL AGE.....	66
Figure 4 NUMBER OF OTHER CHILDREN.....	67
Figure 5 SIZE OF ACCOMMODATION	69
Figure 6 SOCIAL CLASS.....	70
Figure 7 MATERNAL HEALTH DURING PREGNANCY.....	71
Figure 8 BABY'S HEALTH AT BIRTH	73
Figure 9 BABY'S HEALTH SINCE BIRTH	74
Figure 10 BABY'S HEALTH IN WEEK PRIOR TO VISIT.....	75
Figure 11 CURRENT METHOD OF FEEDING	76
Figure 12 LENGTH OF TIME BREAST-FED.....	77
Figure 13 BEDROOM.....	78
Figure 14 PLACE SLEPT OVERNIGHT.....	79
Figure 15 TIME CHILD WENT TO BED/FELL ASLEEP.....	80
Figure 16 SETTling BEHAVIOUR.....	81
Figure 17 SETTling DIFFICULTIES	82

Figure 18	METHODS USED TO SETTLE CHILD.....	83
Figure 19	TIME TAKEN TO FALL ASLEEP.....	84
Figure 20	NIGHT WAKING (nights per week).....	85
Figure 21	NIGHT WAKING (times per night).....	86
Figure 22	TIME TAKEN TO RETURN TO SLEEP.....	87
Figure 23	CUMULATIVE NIGHT-WAKING SCORE.....	88
Figure 24	SETTLING METHODS DURING THE NIGHT.....	89
Figure 25	TIME BABY WAKES IN THE MORNING.....	90
Figure 26	NUMBER OF NAPS PER DAY.....	92
Figure 27	LENGTH OF TIME BABY SLEPT (before 12pm).....	93
Figure 28	LENGTH OF TIME BABY SLEPT (after 12am).....	94
Figure 29	SETTLING METHODS (before 12pm).....	95
Figure 30	SETTLING METHODS (after 12pm).....	96
Figure 31	PARENTAL FEELINGS (relating to baby's sleep pattern).....	97
Figure 32	DEPCAT SCORES.....	100

TABLES

	<u>PAGE</u>
Table 1 PEOPLE LIVING IN THE HOUSE.....	68
Table 2 METHOD OF DELIVERY	72

APPENDICES

		<u>PAGE</u>
APPENDIX 1	HEALTH EDUCATION MATERIAL	110
APPENDIX 2	BOOKLET USED IN PILOT STUDY	111
APPENDIX 3	COMMENTS ON THE HEALTH EDUCATION BOOKLET	126
APPENDIX 4	PILOT STUDY INTERVIEW SCHEDULE	128
APPENDIX 5	LETTER REQUESTING PARTICIPATION IN THE PILOT STUDY	142
APPENDIX 6	PROMPT QUESTIONS USED AT INTERVENTION (Pilot Study)	144
APPENDIX 7	LETTER REQUESTING PARTICIPATION IN MAIN STUDY	146
APPENDIX 8	PROMPT QUESTIONS PLUS PROMPTS FOR VERBAL ADVICE (Main Study)	148
APPENDIX 9	BOOKLET USED IN MAIN STUDY	153
APPENDIX 10	MAIN STUDY INTERVIEW SCHEDULE	171

CHAPTER ONE - INTRODUCTION

1.1 BACKGROUND

Working as a health visitor for a number of years, I found sleep problems in pre-school children to be extremely common. The parents of these children often felt inadequate, frustrated and helpless and they were frequently exhausted. Discussion with colleagues convinced me that health visitors were asked regularly to offer assistance with sleep problems in the course of their everyday work.

Surveying the literature I found that from birth to school age, sleeping difficulties are one of the most common topics on which parents seek advice from health professionals (Richards & Bernal 1974). Previous studies had shown that 22% of nine month old children had settling difficulties and that 42% woke regularly during the night (Hewitt, Galbraith & Pritchard 1993), the sleep disturbance often lasting for months, and in some cases for years (Richman, Stevenson & Graham 1975).

1.2 FORMULATING THE HYPOTHESIS

When helping parents resolve their child's sleep problem many of them said to me that they believed they could have prevented the problem developing if they had known more about sleep and settling behaviour when their child was younger. Rather than waiting until a sleep problem existed, and helping parents to solve it, I formed the opinion that a percentage of problems could actually be prevented. This prompted a review of the literature on sleep problems in the specific area of prevention. The literature did in fact support the view that it may be possible to prevent the development of sleep problems if advice and support were provided in the post-natal period (Douglas 1987; Hewitt 1988). Parents had stated that they found this type of intervention helpful, however, the efficacy of the approach had not been established (Hewitt & Galbraith 1987). Taking into account the views expressed by these authors and also the parents that I had visited I formulated the hypothesis that by giving parents information and advice relating to sleep and settling behaviour in the early post-natal period, the incidence of sleep problems could be reduced.

1.3 THE AIM OF THE PROJECT

The aim of this research project was to evaluate the efficacy of health education in reducing the incidence of sleep problems. The plan was to develop a health education package that, if shown to be effective, could easily be incorporated into the everyday work of health visitors. It was recognised that the provision of information and advice alone would not necessarily be enough to reduce the incidence of sleep problems, as there is no inevitable step-wise progression from knowledge through attitudes to behaviour. It was considered that the health education activities should be participatory, with the parents being encouraged to express their own knowledge and opinions.

Adopting an experimental approach, the study takes what is considered an initial step in determining whether sleep problems can be prevented. It is recognised that in order to assess the long-term value of this preventive approach a longitudinal study would be required, but unfortunately because of time limitations a longitudinal approach was not feasible in this instance.

CHAPTER TWO - THE LITERATURE REVIEW

2.1 INTRODUCTION

A comprehensive review of the literature published in English between 1966 and 1995 was undertaken. A small number of key articles published before this date are quoted. The search was conducted using computerised information retrieval systems and also manually. A variety of abstracting and indexing services were consulted and they included; Index Medicus, International Nursing Index, Nursing Research Abstracts, Health Services Abstracts, Psychology Abstracts, Sociology Abstracts and Social Science Abstracts.

The review of the literature enabled a clear understanding of the subject, presenting information on current knowledge and theories, and highlighting areas where further research was required. The literature search helped in the formation and clarification of the research problem and was crucial in the formation of the research hypothesis. Finally, the literature review provided the researcher with methodological suggestions for the actual conduct of this study.

The review begins with a discussion of the development of the diurnal sleep pattern in the early months following birth and continues with information on the prevalence of sleep problems in pre-school children. Disorders of initiating and maintaining sleep are by far the most common type of sleep problem in this age group and are therefore the focus of the review. The effects of sleep disturbance are examined, showing how parents often feel desperate and in need of support outside the family. The causes of sleep problems are then considered and the complexity in identifying causal factors is highlighted. The review continues with an exploration of the treatment of sleep problems, suggesting that much of the advice given to parents is contradictory. The literature demonstrates that the use of medication is common but it appears that this method of treatment is of limited benefit. It seems that behaviour modification or a psychodynamic approach may be much more successful, and the use of self-help manuals has been shown to be helpful by some authors. Finally, preventive strategies are discussed highlighting the need for further research in this area.

2.2 THE DEVELOPMENT OF THE DIURNAL SLEEP/WAKE PATTERN

Over the first few months of life the features of infantile sleep change and mature (Metcalf, Mondale & Butler 1971). There is a progression from almost randomly

distributed sleep and wake periods of varied lengths spread over the twenty-four-hour period, to a more predictable pattern in which the longest period of sleep occurs during the night (Parmelee, Wenner & Schulz 1964; Coons & Guilleminault 1982). It is between three months and six months of age that sleeping through the night usually begins, with the longest sleep period being well established between 7pm and 7am (Coons & Guilleminault 1982). Although most infants follow this pattern, some do not, and increased waking after six months frequently occurs in children who have previously shown the capacity to sleep through the night (Ferber 1987a).

2.3 THE PREVALENCE OF SLEEP PROBLEMS

A number of studies have attempted to establish the prevalence of sleep problems in pre-school children. The wide variations in sampling procedures, measuring instruments and definitions of sleep disorder mean that the results of different projects are not necessarily comparable. There is general agreement that sleep problems are widespread.

Research indicates that the most commonly occurring problems can be divided broadly into two categories, children who have difficulty in falling asleep and children who wake frequently during the night crying for the attention of a parent (Richman 1986). It has been shown that the two problems often coexist (Richman 1981).

Problems in settling to sleep have been found to occur in approximately 22% of nine-month old babies (Galbraith, Hewitt & Pritchard 1993), 15-20% of one-two year old children (Richman 1981, Scott and Richards 1990a) and 16% of children aged three years (Richman, Stevenson & Graham 1975). Regular night-waking occurs in approximately 42% of nine-month old babies (Galbraith, Hewitt & Pritchard 1993), 20-26% of one-two year old children (Richman 1981, Scott & Richards 1990a) and 14% of children aged three years (Richman, Stevenson & Graham 1975). It is estimated that about 50% of the children who wake overnight also have settling difficulties (Richman 1981).

Sleep problems are often thought of as transitory in nature, however, disturbance to a child's sleep pattern can last for months and persistence for a year or more is not uncommon (Richman, Stevenson & Graham 1975).

2.4 THE EFFECTS OF SLEEP DISTURBANCE

The literature suggests that a sleepless child can make major demands on the coping abilities of its parents.

Chavin and Tinson (1980) carried out a study that sought to determine the effects sleep problems can have on family life. The children in the study were aged between eight months and three years, and were all classified by their health visitor as having sleep problems. Approximately 30% of the parents interviewed thought the main problem was chronic fatigue, however, the remainder felt that there were more serious consequences. Thirty-seven per cent felt that the sleep problem caused serious arguments, 8% admitted administering severe physical punishment to their child and 2% felt that the sleep disturbance had been directly responsible for the break-down of their marriage. Other problems included difficulties with siblings and curtailment of social life and sexual activities.

The demands of a sleepless child can result in interruption to, and changes in the normal sleep pattern of parents. Errante (1985) states that fatigue is one of the predisposing factors in post-natal depression. In some cases she believes that sleep deprivation may be the main problem, rather than post-natal depression. She says that the manifestations of the two conditions are very similar, and what may be assessed as depression, with concurrent anxiety, irritability, apathy, and aggression may, in fact, be a normal reaction to sleep deprivation. Health professionals must be alert to the similarities of the two conditions as the treatment is obviously different.

Haslam (1992) suggests that poor sleep in children can be a final trigger initiating parental violence. Other authors agree, stating that a child who sleeps poorly is at risk of non-accidental injury (Bax 1980; Jenkins 1980; Jones & Verduyn 1983; Crawford, Bennet & Hewitt 1989). These authors do not give statistical evidence to support their case, and so it is considered that their statements should be treated cautiously. Haslam (1992) suggests that parents who injure their child often have other problems, and lack the 'safety valves' that most parents have. He says that it is important that in all cases health professionals take the presence of a sleep problem seriously, and that appropriate help is given.

2.5 CAUSAL FACTORS

The interaction between a child, its parent/s and its environment is complex and therefore the paths of cause and effect can be difficult to determine. The literature highlights the complexity and uncertainty in determining causal factors. Many of the factors that have been found to be associated with the development of sleeping difficulties are discussed below.

Developmental/Medical Factors

In some instances a sleep disturbance may be due to developmental or medical factors. Ferber (1985) states that when these factors cause a sleep problem they are generally easy to recognise and therefore the correlation between cause and effect is obvious. He says in most cases a sleep problem does not have a medical cause, but it is important to exclude medical problems when searching for a cause in a particular case.

Chronic Illness

Some chronic conditions may contribute to habitual sleep disturbance. A child may be in pain or discomfort or have difficulty breathing. When looking for an association between asthma and sleep disturbance Tirosh and his colleagues found that asthmatic children took longer to sleep through the night than the children in a control group (Tirosh, Scher, Sadeh, Jaffe & Lavie 1993), however, by the age of four years the prevalence of sleep problems was similar in both groups. In another study, children with severe asthma were shown to be more liable to develop sleeping difficulties than their peers (Mrazek, Anderson & Shrunk 1985).

Obstructive sleep apnoea may cause disturbed sleep and excessive sleepiness during the day. This condition is associated with heavy snoring, chronic upper airway infection, rhinitis and hayfever and is considered easy to diagnose (Horne 1992).

Chronic middle-ear disease may not be recognised, and yet this can be a cause of sleep disturbance. If the fluid does not become infected, children seldom complain of discomfort during the day but their sleep can be disrupted by the increased pressure causing discomfort when they are lying down (Ferber 1985).

The Premature Baby

Walker (1989) assessed the behaviour of pre-term babies when they were three years old and compared them with a control group of children born at full-term. A significant difference was found between the groups, with those born pre-term having more sleep problems. Walker believes that the parents of the pre-term infants were less able to set limits and suffered more from separation anxiety. She speculates that the parents of premature babies can feel very vulnerable once the baby returns home and sleep problems may result from feelings of anxiety about the baby's condition. Ungerer and his colleagues found that the sleep patterns of pre-term infants differed in the first and second year, but at three years of age both groups were similar (Ungerer, Sigman, Beckwith, Cohen & Parmelee 1983).

Children with Special Needs

It has been shown that sleeping difficulties occur with considerable frequency among children with special needs (Clements, Wing & Dunn 1986). Sleep problems have been found to be prevalent in children who are deaf and also in children who are visually disabled (Tucker & McArthur 1977; Kitzinger & Hunt 1985). Quinn and her fellow researchers found that children with severe physical and mental disabilities are very prone to sleep problems (Quinn, Wade & Hargreaves 1991). They believe that parents tend to be over-responsive to such children and that they often change their usual patterns of child-rearing behaviour. Ferber (1987b) says that in some instances there may be a failure of the ability of the central nervous system to attain the normal sleep stages and diurnal pattern.

Birth History

It has been suggested that there may be an association between detrimental perinatal factors and later night-waking (Bernal 1973). Blurton-Jones and his colleagues believe that it is possible when looking at detrimental perinatal factors to predict which babies will become poor sleepers (Blurton-Jones, Rossetti Ferreira, Farquar Brown & MacDonald 1978). Chavin and Tinson. (1980) disagree, stating that their research suggested no correlation between birth history and the subsequent development of a sleep problem.

Temperament

Carey (1974) reports a significant correlation between night-waking and the temperamental characteristic of low sensory threshold. Children with a low sensory threshold appear to be especially sensitive to changes in their external environment and are

easily upset by factors such as a wet or dirty nappy and changes in temperature or light and darkness.

Allergy to Cow's Milk Protein

It has been shown that sleeplessness in infants may, in some cases be related to an undiagnosed allergy to cow's milk proteins (Kahn, Rebuffat, Blum, Casimir, Duchateau, Mozin & Jost 1987). This study reported that the sleep of insomniac infants became normal after cow's milk was eliminated from their diet and that insomnia reappeared when the children were 'challenged' with milk. The authors conclude that when no evident cause for chronic insomnia can be found, the possibility of milk allergy should be considered.

Environmental/Social Factors

A significant relationship between sleep disturbance and environmental stress has been reported (Kataria, Swanson & Trevathon 1987). The stresses experienced by sleep disturbed children in this study included maternal absence, episodes of depressed maternal mood and illness or accident in the child or family. Richman (1981) found that social stresses such as financial difficulties, illness and bad housing are more common in families whose children are poor sleepers. Scott and Richards (1990a) agree with these findings suggesting that the mothers of night-waking children complained more about housing conditions and overcrowding.

The sex of the child and the social class of families have not been found to be associated with the development of sleep disturbance (Richman 1981, Scott and Richards 1990a).

Caregiving Factors

Feeding

Breast-fed babies have been found to be more wakeful than bottle-fed babies by some authors (Carey, 1975; Osterholm, Lindeke & Amidon 1983; Wright, MacLeod & Cooper 1983). Carey (1975) states that he found no reason to question the adequacy of nutrition and he believes that the reason for the wakefulness may be a difference in the mother-child interaction. He considers the nursing mother more likely to pick up and feed her unsettled baby therefore encouraging him to expect more attention. Other authors investigating this

area found no correlation between the method of feeding and the subsequent development of wakefulness (Bernal 1973; Scott and Richards 1990 a).

Moore and Ucko (1957) and Parmelee, Wenner & Schulz (1964) investigating the claim that the early introduction of solid food would encourage a baby to sleep through the night found no such relationship.

Mental Health Problems

The mothers of sleep-disturbed children are reported as having a higher incidence of depression, nervousness, mental illness, alcohol problems and marital difficulties (Richman 1981). It is thought that these factors probably change "responsivity" and caregiving. This is relevant because responsive mothering has been found to be associated with an infant's sleep/wake organisation (Ferber 1987a). It is recognised that in some cases the sleep problem may effect the mother's mental health.

Circadian Rhythm

Ferber (1987b) states that parents may fail to recognise and respond properly to their infant's emerging circadian rhythm and that a sleep problem may develop as a consequence. He says that proper functioning of these circadian systems requires daily "resetting" of the biological clock. This clock is reset by the predictable occurrence of important time cues such as light, dark, bedtime, mealtimes and patterns of social interaction. Ferber (1987b) shows that a child who lives in a household with little structure often does not receive regular signals across the day and consequently sleeps poorly. It is for this reason that adherence to a predictable daily routine after the early months is seen as an important element in encouraging babies to sleep well (Douglas & Richman 1984; Ferber 1987b; Pound 1989).

Settling Behaviour

Sleep consists of cycles of light to deep sleep which occur with a given periodicity throughout the night (Ferber 1987a). It has been demonstrated by video-taping babies during the night that both good and poor sleepers wake from a period of light sleep and that this waking will occur a number of times (Anders 1979; Minde, Popiel, Leos, Falkner, Parker, Handley-Derry 1993). Children who are considered good sleepers settle themselves back to sleep and children who are poor sleepers appear unable or unwilling to go back to sleep and cry for parental attention. Parents who get their child to sleep before they put it to bed are thought to encourage dependency, and so when the child wakes during the night

it cannot settle without their help (Ferber 1985; Minde, Popiel, Leos, Falkner, Parker, Handley-Derry 1993). These authors consider that after the early months parents should encourage their child to settle itself to sleep at bedtime. They believe that by learning to do this the child will also learn to settle itself during the night when it rouses from a period of light sleep. The authors argue that if a child is not taught to settle itself, a sleep problem will develop as the child gets older.

Separation Anxiety

When looking for the cause of a particular sleep problem, Daws (1993) believes that it is essential to examine the underlying family dynamics. She links sleeplessness to deeper problems of separation and attachment between the mother and the child. Daws believes that a baby's capability to be separated is circumscribed by its parents' unconscious fears and desires, and through over-identification many parents spare their child what they see as the trauma of being separated at night.

Cultural Factors

Bax (1980) states that in cultures where infants share their parents' bed night-waking is not a problem. He speculates that sleep problems may be a product of the widely-held belief in Westernised societies that babies should not sleep with their parents.

A comparison of the contrasting cultures of Japan and the USA showed that rates of sleep problems were very low in Japan where it is normal for mothers to sleep with their babies (Caudill & Plath 1966). However, the suggestion that sleeping alone is a major cause of wakefulness is apparently too simplistic. In Britain sleeping in the parents' bed or room occurs more commonly in children with sleeping difficulties than those without (Richman 1981). In the USA, this has been found so for white families, but not for black families where it was customary for children to sleep with parents (Lozoff, Wolf & Davis 1985). Lozoff and his colleagues believe that a possible explanation for this difference between the white and black families is that when sleeping with parents is not the socially/culturally accepted norm, bed-sharing may suggest parental behaviour such as over-attentiveness or ambivalence which leads to sleeping difficulties.

2.6 TREATMENT

It has been shown that the parents of sleepless children frequently consult health professionals but the advice that is given is often unhelpful (Haslam 1992). When seeking assistance, parents often describe being provided with diverse, conflicting advice and much of this advice has been found to be anecdotal rather than research-based (Ferber 1985). The use of medication, behaviour modification, a psychodynamic approach and self-help manuals are discussed below.

Medication

Chavin and Tinson (1980) found that 71% of the sleepless children referred to them had been given drugs, usually sedatives at some point. The vast majority of parents stated that medication failed to help, however, they did not usually inform their General Practitioner of this failure. They seemed to think that medication was the last resort and that the doctor could offer no further help. In many cases parents continued to give medication although they realised that it was ineffective, fearing that if they stopped the problem might worsen.

Richman (1985) states that in spite of the wide use of drugs there have been few trials to examine the results of their use. She carried out a double-blind trial of a commonly used hypnotic drug (trimeprazine tartrate) and concluded that sedatives are of extremely limited use for most wakeful children.

Behaviour Modification

There is a wealth of research papers suggesting that behaviour modification may be successful in treating sleep difficulties. Most studies that have employed behaviour modification have dealt with small, select numbers, and control groups have not been used. It is therefore difficult to assess whether the technique itself is effective or whether improvement is due to some non-specific effect of the treatment. There is limited analysis in the reported studies of the clients who do not respond well to behavioural techniques.

Richman (1981), who has employed behavioural techniques for many years, states that whatever the original cause of wakefulness, waking often becomes a self re-enforcing habit that can respond well to different parental management. She believes that over-responsive parents can inadvertently encourage the sleeplessness and that the children of these parents do not learn to settle themselves to sleep without their parent being present.

Behaviour modification has been introduced by therapists in clinics where success rates of between 73% and 90% have been reported (Jones & Verduyn 1983; Richman, Douglas, Hunt, Lansdown & Levere 1985; Boomer 1991; Galbraith, Hewitt & Pritchard 1993; Roberts 1993). A paper published by Richards, Bidder and Gardner (1992) reports the findings of an evaluation of sleep clinics in Cardiff over a two year period. Contrary to the reports listed above, the analysis was not supportive of this type of treatment when referral rates, improvement rates and cost-effectiveness were considered. The clinics in this study were jointly run by health visitors and psychologists. Walters (1993) found that the management of apparent sleep problems in community clinics is often not straightforward. She states that 19% of the clients seen at her sleep clinic required more in-depth psychotherapeutic help and in these cases the child's sleep problem was just one part of a dysfunctional family situation.

An alternative way of treating the problem is for parents to attend support groups that advise behavioural treatment. Following this type of intervention success rates of over 73% have been demonstrated (Balfour 1988; Carpenter 1990; Szyndler & Bell, 1992). The mothers who attended these groups found the contact with other parents very helpful.

Treatment can also be delivered in individual clients' homes. The outcome and cost of a health visitor treating sleep problems during her usual working practice have been examined, with the method of treatment being reported as both efficient and cost effective (Crawford, Bennet & Hewitt 1989). The number of families in this study was very small (n=9) and so the results should be treated with caution.

The one study that reports using a control group when assessing the efficacy of behaviour modification demonstrated equal improvement in the control group and the study group (Weir & Dinnick 1988). The authors speculate that the health visitors who were employing the behavioural techniques may not have had sufficient training in this area. They also believe that the sample size was too small (n=51) to demonstrate any significant difference between the groups. They suggest further assessment of behaviour modification techniques using control groups and larger numbers.

Psychodynamic Approach

Daws (1993) believes that one of the most important issues in sleep management is how the parents, mainly the mother, handle issues connected with separation and attachment. She uses a psychotherapeutic approach to help families resolve these issues.

Daws compares her method of treatment with that of behaviour modification. She discusses work by Douglas and Richman (1984) in which they state they do not find it useful to explore the past or investigate the parents' or child's psyche to find the cause of a sleep problem. Douglas and Richman believe that it is more profitable to concentrate on the present parental response and how this may be affecting their child's sleep pattern. Daws disagrees with this premise, believing that a psychodynamic approach allows parents to work out important elements in their emotional relationship with their child.

Although Daws considers improvement rates are probably similar between behaviour modification and her own work, she believes that her clients gain more understanding of the psychological processes involved when focusing on the origins of the problem. She is also convinced that a psychodynamic approach not only helps solve a sleep problem but also has a beneficial effect on the family in general. There are obviously diagnostic implications in assessing which families are able and willing to analyse their family situation and which are not. It is probable that a psychodynamic approach may suit the needs of some families and that behaviour modification is more appropriate for others.

In common with most of the studies using behaviour modification the psychodynamic approach suggested by Daws has not been evaluated using control groups. Daws is cognisant of this fact and she hopes to rectify this in future work.

Written Information

Seymour and his colleagues undertook a comparison of three groups (Seymour, Brock, During & Poole 1989). One group received a standardised night-waking programme where the parents were seen by a therapist and also received written information, a second group received written information only and a third group, which was a control group, did not receive any information. The results demonstrated that the children receiving the standard programme and those receiving the written information only showed significant improvement over the children in the control group. The contact with the therapist appeared to induce a more rapid response to advice but four weeks after the families were seen, these two groups could not be distinguished.

Scott and Richards (1990b) describe a similar study in which they found no significant differences among the three groups. The booklet used in their project did not suggest employing direct strategies and the authors believe that more specific advice may have been more effective.

Several self-help manuals have been published on the topic of sleep disturbance (Douglas and Richman, 1984; Ferber, 1985; Haslam, 1992). How successfully parents employ the advice in these manuals has not been established.

2.7 PREVENTION

Douglas (1987), believes that parents could benefit from discussion of the issues of sleep management in the post-natal period. Hewitt (1988) agrees, stating that behavioural treatment is effective but that prevention may be a much better solution. He suggests that parents could be helped to gain an awareness of some of the difficulties in dealing with sleeplessness, and that information could be included in prevention programmes. Hewitt and Galbraith (1987) describe a project where parents of young babies attended evening classes on the prevention of sleep problems; the aim being to test the 'consumer appeal' of this preventive approach. Most of the parents stated that they found the classes useful, however, there was no attempt to determine whether some degree of prevention occurred.

2.8 SUMMARY

Research has shown that sleep problems in pre-school children are prevalent. In the majority of cases a sleepless child causes significant stress within the family. If parents do not obtain sufficient sleep this may have a detrimental effect on their physical and emotional well-being. It is suggested that a child who wakes frequently and will not settle back to sleep is at risk of physical abuse. Many of the factors associated with the development of sleeping difficulties are discussed, the situation is unclear and contradictory. Medical and developmental factors include chronic illness, prematurity, physical and mental disability, detrimental perinatal factors, temperament and cow's milk allergy. Other potential causal factors are maternal absence, financial difficulties, poor housing conditions, overcrowding, the method of feeding, maternal mental health problems, over-responsive parenting and separation anxiety. The literature indicates that in many cases sleep problems can be helped by appropriate intervention. The use of medication has been shown to be of little value, however, behaviour modification or a psychodynamic approach appear to be successful forms of treatment for many families. The use of appropriate self-help manuals can be helpful for some parents. It has been suggested that it may be possible to prevent the development of sleep problems by providing advice and support in the post-natal period. Parents appear to find this type of intervention helpful, however, research is required to determine whether some degree of prevention can actually be achieved.

CHAPTER THREE - THE RESEARCH DESIGN

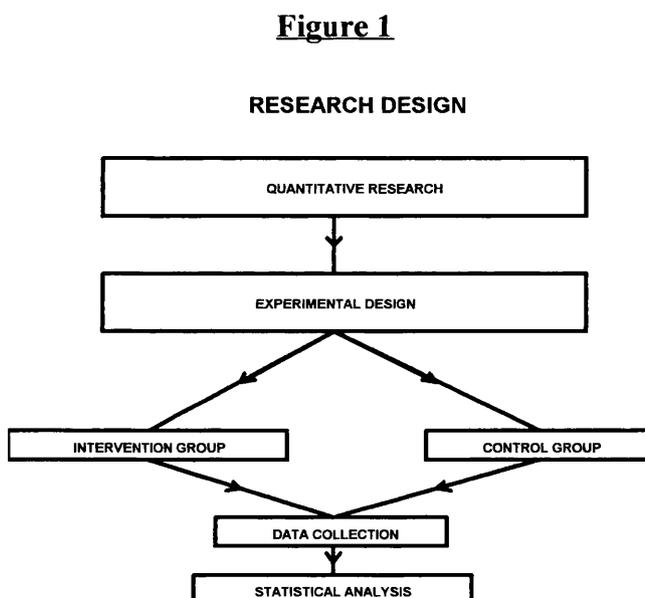
3.1 THE HYPOTHESIS

As stated in Chapter One, the hypothesis was that **the incidence of sleep problems in infants could be reduced by providing parents with information and advice relating to sleep in the early post-natal months.**

3.2 SUMMARY OF THE RESEARCH DESIGN

An experimental design was chosen to test the hypothesis. The sample was divided into two groups, a control group and an intervention group. The participants were allocated to one of the two groups on a random basis. The independent variable, which was the parents knowledge of sleep and settling behaviour, was manipulated when the children were between three and four months old. The dependent variable, which was the sleeping behaviour of the infants, was assessed when the children were between eight and ten months old. Finally, a statistical analysis of the sleeping behaviour was undertaken and the groups were compared. When comparing the groups the null hypothesis was tested, this being that there was not a statistically significant difference in the sleeping behaviour of the control group and the intervention group.

Figure 1 is a graphical representation of the research design, the discussion that follows explains the choice of design.



Before the main study was carried out a small pilot study was undertaken. The principal aim of the pilot study was to assess the adequacy of the health education material and the method of data collection. Additionally, it was considered that the pilot study would give an indication of what the response rate would be in the main study, and it was hoped any procedural problems would be highlighted. The pilot study is discussed in detail in Chapter Four.

3.2. THE EXPERIMENTAL APPROACH

Quantitative methods as a whole should be objective, formal and systematic, using numerical data to quantify and measure phenomena. An experimental approach is one of the most powerful quantitative methods, and is most commonly used for testing hypothesis (Treece & Treece 1986). It was for this reason that this approach was adopted in the study. It was considered that an experimental design, because of its rigorous adherence to the elements of manipulation, control and randomisation should offer the most convincing evidence concerning the effect of the independent variable on the dependent variable. The key elements of experimental design are discussed below.

Manipulation

In experimental research the researcher does not simply observe what happens, but introduces control into the situation by manipulating variables (Brink & Wood 1989; Polit & Hungler 1991). In this study the aim was to manipulate parental knowledge of sleep and settling behaviour (independent variable). This variable was manipulated in order to assess the effect this would have on the sleeping behaviour of the infants (dependent variable). If after manipulating the independent variable, the children in the intervention group were found to be sleeping significantly better than those in the control group it was considered that a causal relationship between the two variables could be inferred. When considering this causal relationship the issue of internal validity was addressed, this is discussed below.

Control

Control was achieved by manipulation, randomisation, standardising the experimental protocol and by using a control group. If sufficient control was not exercised the internal validity of the results would be threatened. In this study the information and advice was delivered in a similar way to all of the families in the intervention group. The families were visited when their baby was 3-4 months old, the same basic information and advice

was delivered at every visit, both verbally and in a written format. The same researcher delivered the information and advice in each instance.

It was recognised that other health professionals such as health visitors and General Practitioners may have had contact with the families during the course of the study. These health professionals may have discussed issues of sleep management and so could have effected the researchers control over the independent variable. In addition, in some cases friends and family may have influenced the situation the researcher was trying to control by offering their advice and opinions. It was considered that these uncontrolled measures would have been different for every family. Attempting to measure the effects of these extraneous influences would have been difficult to achieve in an objective way, because it was not the number of contacts but more the actual effect of the contact that would have been of interest. The potential effects of these influences were not considered problematic because of the use of the control group and the random allocation to groups. Following these procedures these influences should have been evenly distributed between the groups.

Additionally, control was exercised when collecting the data by using a standardised interview schedule which contained mainly closed questions, the aim being to reduce subjectivity on the part of the respondent and also the researcher. Parents were asked to give details of their child's sleep pattern over the one week period prior to data collection on order to reduce subjectivity and inaccuracy in recall. Control was also attempted by increasing the reliability of the measurement instrument, this will be discussed later in this chapter.

Randomisation

The third essential element of experimental design relies on two principles, random sampling and random allocation to groups. In this study, by randomly selecting the initial sample from the target population it was hoped the results could be generalised from the sample to the population in question. Participants were allocated to groups in such a way that each participant had an equal chance of being selected for the intervention group or the control group. Participants were randomly allocated to groups using random number tables (Pocock 1983, p73, Table 5.4).

The individual characteristics of the participants in this study, as in any study were considered to consist of numerous extraneous variables (Polit & Hungler 1991). Using the two procedures discussed, subject characteristics should have been randomly distributed between the groups. The aim was to infer that any differences in the sleeping behaviour

between the groups were due to the intervention, rather than demographic differences between the groups.

Random allocation to groups does not guarantee that two groups will be similar, however, studies have consistently supported the efficacy of random assignment over various ways of matching subjects (Sherwood, Morris & Sherwood 1975). Pocock (1983) states that random assigning to groups is generally preferable to matching or stratifying, providing the sample size is large enough.

Experimental Weakness

Despite the overwhelming advantages of experimental research, the approach does have some limitations. In studies such as this which are undertaken in "real-life" situations it is recognised that determining cause and effect relationships can be complex. The results of research into human behaviour can never be completely controlled because no two individuals or situations are identical (Treece & Treece 1986). Although it can often be demonstrated that the manipulation of the independent variable has an effect, there may be difficulty in explaining why a specific intervention is effective (Cormack 1991).

Issues of external validity can be a potential source of weakness in experimental studies. It was important that the sample in the study was representative of the target population. The research plan was to select a random group from the target population, hoping that this would enable generalisation of the results. However, it was not anticipated that 100 per cent of the sample would agree to take part in the study and so this posed a threat to the generalisability of the results. The response rate and a comparison of the families that agreed to take part in the study with those that did not are found in Chapter Six, a discussion of the potential relevance of these factors is found in Chapter Seven.

In order to assist the external validity of the results the experimental situation was as 'true to life' as possible, with the research setting being the participants own homes. Occasionally in studies where a researcher is evaluating the effect of a particular intervention, factors such as media coverage of the topic can have an effect on the variables of interest. This could potentially limit the effect of the intervention or there may be an effect on the control group by raising their awareness and increasing their knowledge of a topic. Factors such as this are termed "history" (Polit & Hungler 1991), and the researcher may, or may not be aware of such effects, the only logical approach in counteracting this is to carry out replication studies.

The final threat to the external validity of the results is the placebo effect commonly known as the Hawthorne Effect. The fact that both groups were aware that they were involved in the study may have distorted their behaviour, making them no longer representative of the target population.

3.4 THE SAMPLE

Three areas were addressed when selecting the sample. The areas were the sample size, the selection of the sample and exclusion criteria.

The Sample Size

The sample size was determined using text book formulae (Machin & Campbell 1987, p18 Table 3.1), and with the assistance of a statistician. The aim was to select a sample large enough to demonstrate a statistically significant improvement in the intervention group, if it did in fact exist.

The sample size was decided by the four factors which are discussed below.

(a) The percentage of sleep problems in the control group

First of all it was necessary to estimate the percentage of children who would be expected to have sleep problems in the control situation. Previous research has shown that approximately 40% of nine month old children would be expected to have sleep problems, and this was the age that the sleeping behaviour was to be assessed (Galbraith, Hewitt & Pritchard 1993).

(b) The anticipated benefit

It was then necessary to anticipate the degree of improvement in the intervention group, that is, what percentage of the children in this group would have sleep problems at nine months. The estimation of improvement was a compromise between what was considered realistic using clinical judgement and what numbers the researcher could include in the study taking into account the restraints of time and finance. As the anticipated benefit decreases in size the number of participants required in each group rises dramatically.

It was estimated that 20% of the children in the intervention group would have sleep problems. If the degree of improvement was less than this, the numbers in the study would not be suffice to demonstrate a statistically significant difference between the groups.

(c) Significance level

The third consideration was that of significance level. A p-value of $< 5\%$ was taken as rejecting the null hypothesis.

(d) Power

The final consideration when determining the sample size was the false negative or type II error rate that was judged to be acceptable. This was the probability of accepting the null hypothesis of no difference between treatments when the anticipated benefit did in fact exist. The type II error rate, denoted as B was set at a maximum value of $B=20\%$. This is usually alternatively expressed as setting the power of the test as $1-B$, which = 80% .

The next step was to combine the information in each of the four areas above and, from statistical tables, to derive the number of clients required in each group (Machin & Campbell 1987, p18, Table 3.1).

Therefore;

If	(a) the control group sleep problems =	40%
and	(b) the intervention group sleep problems =	20%
the	(c) significance level =	$<5\%$
and	(d) the Power =	80%

the minimum sample size requirements were 80 participants in each group. It was decided to commence the study with between 90 and 100 participants in each group to allow for the potential drop-out rate.

The Selection of the Sample

As previously stated it was decided that a random group of parents would be approached and asked to take part, and that the participants would then be randomly allocated to either the intervention group or the control group. The aim was to obtain a sample which

represented as far as possible the general population of parents with children of this age, thus allowing the researcher to generalise the results to the larger population.

Various methods of obtaining the sample were considered. It was eventually decided that the most practical approach was to obtain the names and addresses of the children from the computerised database held by the Greater Glasgow Health Board. Access to this data was negotiated with representatives of the health board and access was granted.

The sample was drawn when the children were two months old. The families were contacted in writing, and asked to take part in the study. This way of accessing clients involved self-selection by the parents and could have a potential effect on the generalisability of the results (Cormack 1991). However, whatever way the parents were approached and asked to take part, a self-selection process would have occurred. The respondents are compared to the non-respondents in Chapter Six, and the generalisability of the results is discussed in Chapter Seven.

The researcher was uncertain what the response rate would be. The initial decision was to write to the parents of the first 500 babies born in December 1993, assuming a response rate of 40% this would allow the allocation of 100 participants into each of the two groups. The plan was to review this number after a small pilot study. The literature was unhelpful when trying to estimate what the response rate might be. In surveys it is recognised that a response rate of 60% can often be achieved (Treece & Treece 1986). However this was not helpful when home visits on one or two occasions over a six month period were being requested. The literature has shown that the participation rate in studies of this design is generally low (Treece & Treece 1986). It was considered that face to face recruitment in the maternity hospitals would have produced a higher participation rate, however this approach was considered impractical. There are four maternity units in The Greater Glasgow Health Board area and because some mothers are discharged within six hours and others deliver their babies at home it was considered that a random sample could not have been successfully or easily obtained in this way.

Exclusion Criteria

A child's sleep pattern can be effected by physiological factors, and it is recognised that children with physical and/or mental disabilities often have sleep problems (Clements, Wing & Dunn 1986). Additionally, it has been demonstrated that premature babies generally take longer to establish sleep-wake patterns (Ungerer, Sigman, Beckwith, Cohen and Parmelee 1987; Walker 1989). Although there are many commonalities, the needs of

these families may be more complex, and it was considered that these needs could not be addressed in this study.

The following exclusion criteria were agreed;

- (a) babies born before the end of 37 weeks gestation
- (b) moderate-severe physical disability
- (c) moderate-severe mental disability

The information supplied by the health board allowed exclusion of premature babies and some questions were asked on the consent form to allow the exclusion of children with moderate to severe physical or mental disabilities.

A variety of other factors which may be associated with the development of sleep problems were discussed in the literature review. Such factors include breast-feeding, social problems, the child's temperament, allergy to cow's milk, maternal mental health problems and separation anxiety. It was considered that any factors such as these would be evenly divided between the groups because of the random allocation. No attempt was made to exclude these factors because they were seen as factors that constitute any sample of parents and babies randomly chosen from the population.

3.5 THE INTERVENTION

When planning the intervention three areas were addressed.

These areas were:-

- The Procedure used to Manipulate the Independent Variable
- The Decision Regarding who would Deliver the Intervention
- The Timing of the Intervention

The Procedure used to Manipulate the Independent Variable

The experimental design required that parental knowledge of sleep and settling behaviour was altered in one group. A strategy for accomplishing this was developed.

Health Education: The Theoretical Framework

Health education enables people to take more control over their own health, and over the factors which affect their health. As discussed in the literature review, the parents of children who wake regularly may not obtain sufficient sleep, and this has been shown to have a detrimental effect on their physical and emotional health (Chavin & Tinson 1980, Errante 1985). Sleeplessness has been shown to upset family dynamics, with the parents often feeling desperate and in need of support, and in some cases, it has been stated that the presence of a sleep problem has triggered serious parental violence (Bax 1980; Jenkins 1980; Jones & Verduyn 1983; Haslam 1992). The aim of the health education in this instance was to provide parents with information they could use to encourage their child to sleep well.

A 'Modern Educational Framework', as discussed by Downie and his colleagues was adopted (Downie, Fyfe & Tannahill 1990). It was recognised that the provision of information alone was not enough, and that there would be no inevitable step-wise progression from knowledge through attitudes to behaviour. The approach that was adopted aimed to help parents clarify their values and to foster their self-esteem. The health education activities, although structured, were designed to be participatory, with the parents being encouraged to express their own knowledge and opinions.

The Health Education Material

It was considered that any health education material used in this study would have to be easily utilised by others and also be cost-effective. It was decided that a booklet which could be discussed with parents, and left with them at a routine visit was the best way of achieving this aim.

It has been shown that when clients/patients are given verbal information alone, they forget much of what they have been told (Ley, Bradshaw, Eaves & Walker 1973; Ley 1984). It was for this reason that it was considered important to use written material in conjunction with the verbal information in the project.

In this study it was considered that written material would have several advantages and these are listed below:-

- parents could read at their own pace and refer to the material as required
- information could be shared with partners, relatives and friends
- more detailed information could be given than in the discussion
- it could be easily and cheaply produced and could be altered, if required
- parents and researcher could go through the material together

It was recognised that written material has some limitations, and these were addressed. It has been shown that the average reading age in the United Kingdom is between nine and ten years of age. Booklets and leaflets have to be written for the average consumer and so the information contained in written material may therefore not be accessible to members of the public with lower than average reading skills. The plan in this project was to discuss the information and advice and to consolidate the discussion with the written material. Participants who had poor literacy skills, although disadvantaged, still received the benefit of verbal advice. Advice was sought on readability from the Health Education Board for Scotland and the booklet was written to maximise the proportion of the sample that would be able to understand it (this will be discussed in detail later in this chapter).

Other disadvantages of written material are that booklets and leaflets can be easily lost, or discarded. By discussing the content of the booklet, the researcher aimed to rouse interest in the material and to encourage the parents to read it rather than discard it after the visit. In addition, partners and family and friends were encouraged to read and discuss the content of the booklet as well as the mothers.

The Development of the written Material

The written health education material was developed utilising a model discussed by Bernier and Yasko (1991). This model consists of five stages, and these are discussed below:

- (a) The Pre-Design Phase
- (b) The Design Phase
- (c) The Pilot Phase
- (d) Distribution
- (e) Evaluation

(a) The Pre-Design Phase

The aim of this phase was to collate the information that would be contained within the health education material. The focus was on assessment, data gathering and planning.

The information given to clients was research-based and the information, and the advice gleaned from it, was gathered by reviewing the literature relating to sleep and sleep problems. The particular area of interest when collating this information was factors that were thought to be associated with the development of sleep problems along with treatment and preventive strategies discussed by other authors.

In this phase, in addition to the general literature review, an evaluation of existing health education material relating to sleep and sleep problems was undertaken. This was to ensure that suitable material was not already available. There was a dearth of booklets/leaflets specifically relating to this area of child care. A full list of the material reviewed can be found in Appendix (1). None of the literature was considered to be appropriate, mainly because the focus was on the treatment of sleep problems rather than on prevention. Two leaflets contained some preventive advice (Pontefract Health Authority (no date of publication), Southmead Health Services (no date of publication)). However this was not considered comprehensive enough to achieve the desired outcome of this project, that is to increase knowledge and help parents prevent sleep problems developing.

At the end of this phase the information had been gathered that would be included in the health education booklet. When reviewing the potential causal factors discussed in Chapter Two, it was obvious that the researcher and the parents would not be able to influence such factors as detrimental perinatal factors, temperament and social and environmental factors. The plan was therefore to focus on areas that the parents could influence and so those areas listed under Caregiving Factors were targeted. It was considered that the booklet should commence by discussing sleep itself, it was felt that it was only by understanding what happens during a period of sleep that parents could learn how to encourage their babies to sleep well. The information in this section of the booklet was based on the work of Anders (1979) and Minde and his colleagues (Minde, Popiel, Leos, Falkner, Parker, Handley-Derry 1993). The parents were given basic information on light and deep sleep, with the fact that all babies rouse a number of times during the night being discussed. The next step was to discuss 'normal' sleep patterns at different ages, it was emphasised that what was quoted was average figures, and that every baby differs in the amount of sleep it requires (Metcalf, Mondale & Butler 1971; Coons & Guilleminault 1982). Following the discussion of sleep patterns was a section which highlighted some of the factors that may

cause sleep problems (Bernal 1973; Carey 1974; Anders 1979; Ferber 1985; Walker 1989). Finally, advice was given on how to encourage babies to sleep well. The advice in this section concentrated on the importance of a bedtime routine (Ferber 1985; Douglas & Richman 1985) and settling behaviour that has been shown to encourage babies to sleep well (Anders 1979; Minde, Popiel, Leos, Falkner, Parker, Handley-Derry 1993; Douglas & Richman 1985).

(b) The Design Phase

The design phase involved the actual construction of the material. The literature shows that there are many areas that should be considered when producing written information and these are discussed below.

The Readability of the Text

The first of these factors is the readability of the text contained within the health education material.

If the reading level of text is beyond the skill of the reader, comprehension will be decreased, recall will be sketchy and inaccurate and motivation will be reduced (Pastore and Berg 1987). Meade and Smith (1991) state that it is important that health literature be written at levels that are congruent with clients' reading levels. They go on to say that information that is written above the reading level of clients is useless and is also a waste of time and money. They consider that information that cannot be understood prevents clients from becoming active, responsible partners and informed conscious decision-makers.

In 1991 Shire Hall Communications commissioned a study which assessed the readability of written materials produced by pharmaceutical companies, food manufacturers and health educators. The study demonstrated that more than a third of the population would not be able to understand the majority of the material analysed (Reading and Language Information Centre 1992). The majority of reading material required a reading age of at least fourteen.

It is suggested that there is an achievable "bottom line" for most health messages that will allow 80% of the population to read and understand the text (Reading and Language Information Centre), it is considered that this level should not offend those whose comprehension is above the baseline. Klare (1976) has shown that material that is easy to read is not unacceptable to the more literate reader. Breen (1992) agrees, stating that

highly skilled readers will not be offended by simple, clearly written material. She states that someone who is capable of reading at a highly skilled level does not necessarily prefer difficult text. In most situations people prefer easy material and able readers who wish to find out more have the knowledge and resources to do so.

There are a variety of factors which can aid readability and they are discussed below.

Readability Formulae

In an effort to produce more accessible and readable materials, health writers have increasingly relied for guidance on readability formulae. Readability formulae are mathematical equations which attempt to predict the level of reading skill necessary to read a particular piece of writing. They were first developed in North America in the 1920's to help school text writers gauge the level of their material. Reading ease formulae are usually based on word size and sentence length (Breen 1992). The score for a particular text can be computed by hand but today software packages are available that will produce a readability score for written material within seconds.

In recent years, some authors have shown that readability formulae are not a panacea for making a text easy to read, and that reading level is only one of the elements that should be considered in developing written material (Dixon 1990; Meade & Smith 1991; Breen 1992). Health writers who rely too heavily on these formulae are liable to produce literature that they mistakenly believe is easy to read. Meade and Smith (1991) state that the process of reading and understanding is far too complex for any one formula to predict readability with accuracy. Word difficulty and sentence complexity are certainly key determinants of the readability of a text, but they are not the only ones.

Breen (1992) states that a written product must address not only the elements of reading ease, but also factors such as layout and presentation. She says that meaning, relevance, cohesion, flow, logical order, the familiarity of the subject and the appropriateness of the vocabulary are also important factors, but none of these is measured by readability formulae. In addition, she says that readability formulae cannot detect the presence of difficult constructions, such as embedded clauses and passive verbs, that can make reading particularly difficult. Other disadvantages are that there is no measure of the complexity and number of ideas in a text, and word order is not measured, so scrambled words will produce the same result using readability formula as a correctly structured sentence.

Breen (1992) also states that readability formulae do not pick up inaccuracies of bias, gender, class, education and culture. Nor can they assess the impact of illustrations which

are used widely in printed material and which may be interpreted in different ways by different readers. She voices concern that readability formulae ignore design features such as page size, type size and style, line spacing, margins, contrast and colour.

In recent years, in addition to the software that assesses reading ease, computer packages known as grammar and style checkers have been developed. These programmes can assess grammar, punctuation, style and readability. They can also identify certain flaws in writing style such as inappropriate use of jargon, split infinitives and passive constructions, errors of gender can also be detected.

Dixon (1992) believes that, used in addition to readability formulae grammar and style checkers can certainly be helpful when producing literature but, again, it must be emphasised that grammar and style along with reading level are only one part of what makes a text understandable.

When producing written material, The Reading and Language Information Centre (1992) state that in addition to clients being able to read it, it is essential that it be interesting and appealing, and that clients will actually pick it up in the first place. In addition to the inclusion of readable text they say that there are many other factors that have to be addressed which affect a person's ability and willingness to read. They state that the general layout and presentation of written material is important: this includes the format, the print size, the type face, spacing between words and lines, the colour of the print and paper, and the page size. They also say that the title of the material and headings and sub-headings should be clear and concise giving the reader an appropriate indication of what the text that follows will be about. Silver (1991) suggests that the inclusion of graphics can make health education material more lively and enjoyable.

The Booklet Production in this Project

The design phase ended with the production of the booklet. The Readability was assessed with the aid of the Health Education Board for Scotland using two computerised software packages which have been endorsed by The Campaign for Plain English (StyleWriter; Corporate Voice). The text was assessed as being easy to read by 87% of the population. Some minor changes were made which mainly consisted of changing passive verbs to active verbs.

As previously stated, assessing **readability** is just one important element when designing successful written health education material.

The layout and presentation of the booklet was chosen following the recommendations of The Reading and Language Information Centre (1992) and Silver (1991). An A5 booklet which contained text and graphics was produced. Black, 11 point Seriffed print on white paper was used. There was adequate spacing between lines and words, with plenty of white space. The title that was chosen was clear and concise, as were the different headings, allowing the reader to understand what the ensuing text was about. Paragraphs were not split between pages, and any emphasis was in bold. The aim of the layout was to allow the reader to build up their knowledge as they read through the booklet. There was a table of contents at the beginning and a summary of vital information at the end. Graphics were incorporated where appropriate hoping that they would lighten the text and make the booklet more enjoyable.

(c) The Pilot Phase

Once the initial booklet had been designed the next step was to 'pilot' it with a sample of the target audience. A copy of the pilot booklet can be found in Appendix 2.

Bernier and Yasko (1991) state that a draft of the health education material should be piloted with members of the target audience and also with appropriate health professionals. They believe it is important that the people who are piloting the material are instructed in their role, and they understand what they are being asked to do. The purpose of the material should be made clear to the subjects in the pilot study. Glasper and Burge (1992) believe that the responses of a sample of the target audience can provide the best measure of whether or not the material will be useful.

Dixon (1992) states that the group piloting the material should be asked to be as constructively critical as possible, and to point out any ambiguities or errors. They should be asked for their general reaction; was the material useful?, what did they like about it?, what did they not like about it? In addition clients should also be asked to comment on the general presentation, layout, text, and also on any illustrations or photographs that have been incorporated into the material.

Once the pilot study is complete, the feedback from the subjects should be used to revise and improve the health education material. It may then be necessary to pilot this revised draft with a second group of subjects (Bernier & Yasko 1991). Glasper and Burge (1992) say that if health education material is tested in the field, and modified accordingly, there is no reason that it should not be successful.

The booklet was piloted with eleven families. Letters were sent to a randomly selected group of families requesting their participation in the pilot study. Those that agreed to take part in the study received the booklet a week before the researcher visited. They were asked to read it and that the researcher would discuss their views when she visited.

The participants were asked to comment in detail on the text and graphics, their comments being noted and analysed using a database. A copy of the form that was completed can be found in Appendix 3. The booklet was also piloted with a number of health professionals (n=6) and their comments were added to those of the parents.

A detailed discussion of the comments, and changes that were made can be found in the next chapter. Once piloting was complete, the next stage was to distribute the material in the main study. If a large number of changes have been made after the initial pilot study, it may be necessary to carry out a second pilot study, this was not considered necessary in this instance.

(d) Distribution

As previously stated the booklet was given to parents to consolidate the verbal information when visiting families. The babies were three to four months old when the parents received the booklet. The information and advice in the booklet was discussed section by section with the parents being encouraged to ask questions and voice their opinions. Partners and family and friends were also encouraged to read the booklet.

(e) Evaluation

Bernier and Yasko (1991) state in this final stage of their model, that it is essential to evaluate the efficacy of a particular piece of health education material. If it does not appear to have achieved its aim, the content and method of delivery must be re-assessed.

In this study the sleeping behaviour of the infants was assessed when the children were 8-10 months old. The aim of the evaluation that followed was to ascertain whether the booklet, along with the verbal advice, appeared to have been effective in helping parents prevent their child developing a sleep problem.

An additional important element in the evaluation was to ask parents to state what they felt about the information and advice that they had been given. Parents were encouraged to comment freely once the data relating to their child's sleeping behaviour had been collected.

The Decision Regarding who would Deliver the Intervention

The aim of this study was to design a health education package that if shown to be effective health visitors could easily incorporate into their everyday work. In this experiment it was essential that as much control as possible be achieved, the researcher considered recruiting health visitors to give the advice, however this was rejected for a variety of reasons. The reasons are listed below:-

1. If a family moved during the period that the study was being carried out they may change health visitor.
2. If a family changed their General Practitioner during the study they may change health visitor.
3. The advice would have been delivered in a different way by each health visitor and so it would have been difficult to separate the effect of the advice from the effect of individual health visitors.
4. Contamination of information between the intervention group and the control group, could occur as health visitors often cover each others case-loads and clinics, and health visitors from different parts of the city might meet at seminars and study days.
5. Due to heavy workloads, there may have been difficulty in some areas of the city seeing participants at the appropriate age.
6. Health visitors may see the giving of the information as a low priority.
7. If health visitors see clients regularly at child health clinics they may not carry out a home visit when a child is approximately three months old. Although not ideal, the information and advice could potentially be given at a child health clinic. However, for the purpose of the study, it was important that as much control as possible was exerted over the way the advice was given, and that the members of the intervention group all received the advice in a similar manner.

In order to exert suitable experimental control over the manipulation of the independent variable it was decided that the researcher would visit families and give the advice for the purpose of the study. If the information appeared to be effective in helping parents to prevent sleep problems the plan was then to encourage the use of the information and

advice by health visitors in the course of their everyday work. The efficacy of this approach would of course require evaluation.

The Timing of the Intervention

Several factors combined to determine the timing of the visits to families at three to four months. The aim was to prevent sleep problems developing and so visits had to be made in the early post-natal months. Coons and Guillemineault (1982) have shown that by three months of age the majority of babies have the ability to sleep through the night. They state that of those who have not settled by three months, the majority have settled by six months of age. Until the age of three months sleep patterns are often unsettled and variable. The researcher's experience as a health visitor was that in the early weeks parents tend to be concerned with feeding and the general care of their baby, they are busy and tired and are possibly not particularly receptive to preventative information and advice. Parents expect to have disturbed sleep in the early months and it tends to be at around the age of three months that they start to expect their baby to sleep through the night and for themselves to get a night's sleep again.

Another factor influencing the timing of the visits was that a previous project carried by Anderson and her colleagues demonstrated that mothers felt three months was the most suitable time to receive advice on the prevention of sleep problems (Anderson, Marshall and Illman 1987).

Finally, although the visiting patterns of health visitors vary according to the area in which they work and individual clients needs, there is generally a recommended 'core' number of visits, with a home visit normally being carried out at approximately three months.

Taking all of the above factors into account it was decided that the advice would be given at approximately three months of age. The study sample was large, and because the advice was being delivered by one person it was decided that the advice would be given when the babies were three to four months old. The families in both groups received visits as normal from their health visitor.

3.6 THE METHOD OF DATA COLLECTION

As discussed previously the independent variable was manipulated in order to assess the effect that this would have on the dependent variable, the sleeping behaviour of the children.

Five areas were addressed when developing the data collection tool that would assess the dependent variable, and they are listed below.

- Instruments Used by Other Researchers
- The Choice of Instrument for this Project
- The Construction of the Interview Schedule
- Reliability
- Validity

Instruments Used by Other Researchers

The initial step was to review the literature to identify what instruments had been used by other researchers who had assessed the sleeping behaviour of infants. There were four ways in which data had been collected; by questionnaire, by interview schedule, by sleep diary, and by infra-red video-taping of babies during the night.

Although the method of data collection was discussed in most articles, there were no details of the actual content of the instruments used. Two instruments were obtained; a sleep diary which has been used by Richman in much of her work (Richman 1981; Richman 1985; Richman, Douglas, Hunt, Lansdown & Levere 1985); and a questionnaire which was used by Scott and Richards (1990) in their study of the sleeping behaviour of one-year-old children in England. Although both of these instruments covered some of the areas of interest in this project, it was considered that they were not wholly appropriate in this instance. The researcher wished to obtain more information than was collected in the sleep diaries used by Richman, and so although this method of data collection has been shown to be useful (Minde, Popiel, Leos, Falkner, Parker & Handley-Derry 1993), the amount of information obtained in this way was not comprehensive enough in this instance. Scott and Richards (1990) had collected information on parental attitudes to the child's sleeping behaviour and also on support networks, and so although their questionnaire was helpful, much of it was not relevant in this particular study.

It was decided that an instrument which would fulfil the requirements of this particular study should be constructed

The Choice of Instrument in this Project

Two methods of data collection were considered, namely a self-report questionnaire and an interview schedule. The advantages and disadvantages of using each were considered before deciding which method to use. A brief explanation for the choice of interview schedule follows.

It is generally recognised that questionnaires have several advantages and disadvantages (Treece & Treece 1986; Cormack 1991; Polit & Hungler 1991; Oppenheim 1992). Questionnaires are less costly in terms of time and money, they allow gathering of data from a widely scattered sample, they are relatively inexpensive, they are one of the easiest tools to test for reliability and validity and the participant has time to contemplate his/her answers. Another advantage of questionnaires is that the respondent can remain anonymous and therefore may answer in a more open, honest way. Questionnaires are also less prone to interviewer bias (Polit & Hungler 1991). Cormack (1991) states that the advantages of using questionnaires have to be balanced with numerous disadvantages. The response rate is often low when self-report questionnaires are used and it is known that respondents often omit or disregard questions. The amount of information that can be gathered is limited by the subject's available time and interest. Some questions may be misunderstood, and of course the sample is limited to those who are literate. It is recognised that the subjects who respond may not be representative of the population. The researcher cannot observe the subjects non-verbal cues and cannot interact with the subject. Questionnaires are generally more useful when asking simple, closed-ended questions.

Like the questionnaire, the interview has advantages and disadvantages (Treece & Treece 1986; Cormack 1991; Polit & Hungler 1991; Oppenheim 1992). One important advantage is that the data from each interview should be able to be used, no items should be omitted either accidentally or purposefully. If the interviewee does not understand a question it can be repeated and explained. A higher response rate is obtained, verbal and non-verbal cues can be picked up, respondents do not need to be able to read and write, and finally respondents cannot be influenced in answering the current question by looking ahead to other questions. An interview may be more appropriate when the answer to open-ended questions are required, or when in-depth probing is necessary. There is also more opportunity to appraise the validity of the report when interviewing. The main disadvantage of interviewing is that it is very time consuming and expensive. If there are different interviewers the data obtained from one may differ from another, and so there may be interviewer bias. Treece and Treece (1986) state that in an interview subjects may give responses that seem to be what the interviewer wants. The presence of the interviewer

may influence the subjects so that they answer the questions differently than they would if filling in a questionnaire.

In an experimental study such as this, it was recognised that a standardised approach was essential so that all participants were asked the same questions in the same order in a similar manner, and that closed ended questions should dominate. These factors are normally satisfied when using a questionnaire, however there were additional elements in this particular study which eventually prompted the decision to use an interview schedule.

It was important that the researcher exert as much control over the experimental situation as possible. By using a standardised interview schedule the researcher could ensure that the questions were delivered in a similar way and in the same order to every parent. The parents were asked to give details of their sleeping behaviour over the seven day period before the researcher visited. It was felt that it was important to insist on this to exclude subjectivity on the part of the parents. If parents were asked how their child "normally" slept, subjectivity would be inherent. In addition a child may develop a sleep problem over a limited period and parents would not necessarily be able to tell whether their child had developed a sleep problem or whether he or she was just having a few unsettled nights. Additionally, if the questions were not confined to the week prior to the visit the recall of the parents would be liable to be inaccurate. It was considered that if questionnaires were sent to parents they were more liable to fill in details of how their child 'normally' slept even though they were asked about the previous week, when visiting with an interview schedule the researcher was able to insist that parents gave details of the preceding seven days. There was, of course, no way of ascertaining whether the answers given reflected the truth of the previous seven days. It was recognised that some children may have been unwell or teething for example in the week before the visit and questions were asked to allow evaluation of these factors.

Another reason for using an interview schedule was to allow explanation of the questions to any participants with poor literacy skills. By visiting it was considered that the response rate would be higher than by sending out questionnaires, and also each interview schedule would be complete and able to be used. Although a questionnaire could be anonymous it was considered that the parents of children who were sleeping poorly may be less likely to return the questionnaire, particularly in the intervention group, and that this would bias the results. Alternatively if all participants were interviewed the interviewer could make strenuous attempts to see all of those that originally agreed to take part.

Another reason for using an interview schedule was the inclusion of some open-ended questions relating to maternal health during pregnancy and the health of the baby at birth

and since. It was considered beneficial to be able to discuss these questions because some parents may have been confused by medical terminology and that discussion with the researcher would have enabled clarification of the situation.

An additional reason influencing the choice of an interview schedule as the method of data collection was that once the interviewer had completed the interview schedule the members of the intervention group were asked to discuss the health education booklet. A question could have been added to a postal questionnaire, however it was considered that this qualitative data was best obtained by talking to the parents. The booklet was designed to be used by health professionals working with, and visiting families and so parental opinion on the material were crucial.

Finally, the researcher considered it more appropriate to visit because it was considered important to give advice to those parents of children who were not sleeping well. The researcher did not feel comfortable, nor consider it ethically correct to withhold advice completely from the control group. To ask questions about a child's sleep pattern and to discover a sleep problem without intervening was considered unethical. When such problems were elicited the problem was discussed in detail with the parent/s at the end of the interview. A booklet was produced covering much of the same ground as the initial preventive booklet, however it was adapted to give advice to parents on what to do if their child actually had a problem, rather than how to prevent a sleep problem. In addition members of the intervention group who had a child who was sleeping poorly also received this additional advice, and solutions were discussed in detail. If parents required more assistance and support to help implement the treatment programme they were asked to contact their health visitor.

The Construction of the Interview Schedule

The most important requirement of the interview schedule was that it was suitable to collect data which could be used to test the hypothesis, because of the experimental design it was essential that it had a standardised format. The interview schedule was designed to ask questions which had a direct bearing upon the dependent variable (the sleeping behaviour of the children). The areas that were evaluated were derived from the literature and from the researcher's experience of working with the parents of young children. The questions relating to the sleeping behaviour covered for broad areas, settling behaviour, night-waking, early-waking and naps. The parents were also asked to indicate on a 7 point Semantic Differential Scale how they felt about the way their baby was sleeping. Demographic data was also collected in order to assess whether the demographic

characteristics of the two groups were similar. The groups had been randomly allocated, and so the groups should have been similar, the collection of this data served as a double-check.

When formulating the questions consideration was given to the method of coding and analysis that would be employed.

The interview schedule was developed following the guidelines discussed in Oppenheim (1991) and Polit and Hungler (1991). The issues of reliability and validity were addressed.

Reliability

It was recognised that the reliability of the interview instrument depended on the wording of the questions and that the questions should have the same meaning for all respondents. It was considered imperative that the interview schedule be as accurate and consistent as possible. There were two potential sources of inaccuracy, firstly error in the interview schedule itself, and secondly inconsistency in the administration of the interview schedule. These two areas are discussed below.

It is known that the wording of questions can influence the results a study and so great care was taken not to influence the participants in any way. It was considered important that the parents had enough alternatives in the questions that were closed-ended so that they would not be forced into choosing an alternative that did not accurately reflect their situation. Double negatives were avoided, as were lengthy questions, suggested answers and ambiguous questions. Items were organised into units, and there was an obvious progression from one question to another. Strenuous attempts were made to allow the parents to easily understand the questions. The form of language was chosen to facilitate communication and avoid patronising, confusing, embarrassing or upsetting the parents. It was recognised that every word does not have the same meaning for every person and an attempt was made to formulate the most comprehensible questions possible.

In addition to the attempts that were made to limit inaccuracy in the instrument, efforts were made to limit potential error created by inconsistency in the administration of the instrument. A standardised interview schedule was used and the interviewer was not permitted to change the wording or the order of the questions. Each interview was conducted in a similar manner. When visiting and using the interview schedule every effort was made to ensure that the questions were delivered in a value free way. The researcher made a conscious effort to adopt an impartial and unbiased approach. It was recognised that complete impartiality is difficult to achieve.

Validity

For the results to be meaningful, efforts were made to establish the validity of the interview schedule. Attempts were made to ensure that data was collected with the minimum distortion so the questions should elicit as closely as possible the true response of the parents. Questions were constructed that did not 'lead' the respondents into making particular responses, and most questions were closed ended to reduce bias caused by the interviewer and corruption of the actual answers during coding.

The content validity was addressed in two ways. Firstly, the instrument was developed after reviewing the literature relating to sleep and sleep problems and also after viewing instruments used by other researchers. Secondly a variety of health professionals with experience of sleep problems were asked to read and comment on the content of the interview schedule. Some minor changes were made after their comments had been elicited.

Face validity merely defends the extent to which the instrument appears to measure what it claims. Treece and Treece (1986) state that the face validity should be addressed in every study. If a researcher looks at a questionnaire or interview schedule and it seems to focus on the selected topic then the instrument appears appropriate on face validity. The face validity was assessed and was considered accepted, it is recognised that this procedure involves a high degree of subjectivity.

A pilot study was carried out to help address the issues of reliability and validity that have been discussed. Efforts were made to rigorously test the format of the interview schedule with the aim being to reduce to a minimum any potential bias, difficulties in comprehension by the parents and errors or difficulties in completion by the interviewer. A copy of the interview schedule used in the pilot study is in Appendix 4. The piloting of the interview schedule is discussed in detail in the next chapter.

3.7 STATISTICAL ANALYSIS

The final stage when considering the methodology was to plan how the data that was obtained would be analysed. Discussions had been carried out with a statistician when the interview schedule was being designed, and again once the pilot data was collected. In the main study descriptive statistics were prepared from the data that was collected and on viewing these the researcher was able to make a final decision on which was the most

appropriate statistical test when comparing the groups. The statistician was consulted to confirm that the researcher's choice of tests was correct.

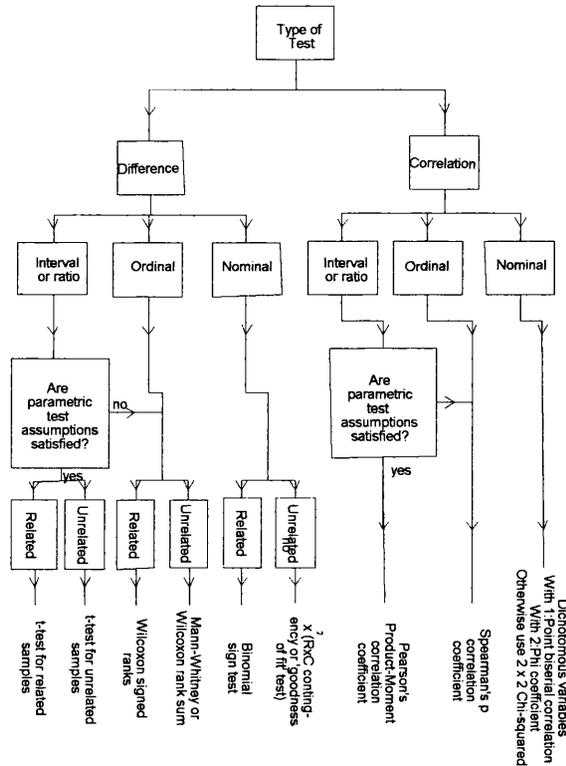
The statistical analysis involved a comparison of **two** groups and what was assessed was whether there was a statistically significant **difference** between the groups. Two statistical tests were used when comparing the data, the Chi-squared Test and the Mann Whitney U Test. The choice of test for each question was dependent on the type of data that was collected, the Chi-squared Test was used when comparing nominal data, and the Mann Whitney U Test was used when comparing ordinal data. The Mann Whitney U Test was the appropriate statistical test when comparing the ordinal data because parametric test assumptions were generally not satisfied.

The two sections of the interview schedule were addressed separately. When assessing the demographic data the null hypothesis was that **their was not a statistically significant difference in the demographic details of the control group and the intervention group.** When assessing the sleeping behaviour of the infants the null hypothesis was that **their was not a statistically significant difference in the sleeping behaviour of the control group and the intervention group.**

Figure 2 on the next page is a graphical representation of the paths that were followed when deciding which tests should be used. The chart is adapted from one developed by Coolican (1994).

Figure 2

CHOICE OF STATISTICAL TEST



Following the paths on the flow chart it can be seen how the decision was made to use the two statistical tests.

It is recognised that the choice of significance level is rather arbitrary, stating that values on one side of it are not significant, and those on the other side are significant. Nevertheless two 'cut-off' points of 5% and 1% are commonly recommended by statisticians (Campbell & Machin 1990). It was agreed in this study that a significance level of 5% would reject the null hypothesis, this meant that there were 5 chances in 100 of rejecting the null hypothesis in error.

3.8 ETHICAL APPROVAL

The final stage when designing the study was to submit details of the proposed research to the local ethical committee. The primary purpose of Ethical Committees is, of course, to protect potential subjects from any harm.

After discussion with the secretary a comprehensive report of the research design was supplied to the ethics committee. This report included details of the proposed way of recruiting participants, the information and advice that would be given and also a copy of the interview schedule. A copy of the introductory letter was provided, this letter guaranteed the participants confidentiality and parents were asked to sign a consent form if they wished to take part in the study.

Once ethical approval had been granted all General Practitioners and health visitors working in the Greater Glasgow Health Board area were notified that the study was being carried out. These health professionals were given limited details of the project, and they were not told whether their specific patients/clients were taking part.

CHAPTER FOUR - THE PILOT STUDY

4.1 INTRODUCTION

It is recognised that unforeseen problems often arise in the course of a project (Treece & Treece 1986; Polit & Hungler 1991). Oppenheim (1992) believes that pilot work is essential to prevent later problems, and that if a fault finds its way into the main study it may prove irretrievable. He suggests that studies which have not been adequately piloted may contain procedural difficulties and may also produce unquantifiable, uninterpretable data. It is recommended that, if feasible, all steps of the main study be piloted so weaknesses can be detected.

In this study the pilot study had several aims: it enabled the health education material to be tested, it provided a means of testing the adequacy of the interview schedule, it helped acquaint the researcher with potential procedural problems, and finally it enabled the researcher to get an indication of the mileage and travelling time for the main study.

4.2 THE SAMPLE

Participants in a pilot study should possess the same characteristics as those in the main study, and so the sample for the pilot study was drawn from a similar population to that in the main study. In the pilot study, due to time limitations, it was not feasible to mimic the gap of five to six months between the intervention and the data collection as planned in the main study. Consequently, two random groups of babies were selected, with the criteria for selection being that one group would be three months old and the other would be nine months old when visited. The group that would be three months old were chosen to allow the researcher to test the delivery of the verbal information and advice and also the written material. The group that were nine months old were chosen to help test the interview schedule.

The Size of the Sample

As discussed in Chapter Three, the researcher was unsure what the response rate might be in a study of this design, and one of the aims of the pilot study was to give an indication of what the response rate would be in the main study. It was essential to get an indication of how many letters should be sent out to produce a large enough sample size. A working

assumption was made that approximately 40% of those contacted would agree to take part in the study. If a greater percentage responded in the pilot study this would indicate that a smaller number of letters should be sent out; alternatively, if a smaller percentage than anticipated agreed to take part the researcher may have to send out a larger number of letters.

It is generally accepted that a pilot study should contain approximately ten percent of the numbers to be used in a main study (Treece & Treece 1986), and it was therefore decided that approximately nine participants would be recruited into each group. In order to have nine participants in each group it was considered that approximately 50 letters should be sent out. Access to the names and addresses of clients had been negotiated with the Greater Glasgow Health Board and a total of 62 names and addresses were initially supplied. The reason that more than 50 were supplied was to allow the researcher to exclude premature babies, this resulted in the exclusion of 10 babies. A total of 52 letters were therefore sent out, 22 to the parents of the babies that were almost three months old, and 30 letters to the parents of the babies that were almost nine months old. A copy of the letter requesting participation in the study can be found in Appendix 5.

4.3 THE RESPONSE RATE

The aim when contacting the parents was to produce as high a response rate as possible. When constructing the introductory letter the researcher followed the recommendations discussed by Oppenheim (1992). Potential respondents were given information on the general topic of the research, and details were given of who the researcher was and which establishment she worked in. After the purpose of the research had been discussed, the parents were told why they, in particular, had been selected. Details of what their participation would involve were given, with potential participants being told they would be visited at home on one occasion in the next few weeks, that the visit would last approximately one hour and that their baby's current sleep pattern would be discussed. An explicit statement was made that any information discussed would be confidential. Letters were addressed personally by the researcher and a stamped addressed envelope was enclosed for replies. Parents who wished to participate in the study were asked to reply within two weeks.

The overall response rate was 46% (n=24). The response rate from the parents of the older children was 59% (n=13) and the response rate from the parents of the younger children was 37% (n=11). The majority of replies were received in the first week. No letters were returned by the Post Office.

The difference in response between the groups was interesting and the researcher can only infer what the reasons may have been. It was recognised that the difference may have been due to chance but it was thought that it was more likely that the parents of the three month old babies were very busy with what was still a very young baby and some of them would have been returning to work at the time the researcher wished to visit. When considering what the response rate might be in the main study the conclusion was that the response rate would be approximately 37%. This was because the babies would be of a similar age to the younger babies in the pilot study. It was therefore estimated that approximately 500 letters would have to be sent out in the main study to obtain a large enough sample.

4.4 THE INTERVENTION

As previously stated eleven families agreed to take part in the part of the pilot study which was designed to 'test' the intervention. The parents were informed when they were visited that they were taking part in a small study which was part of a larger study which would be looking at the prevention of sleep problems.

The visits were divided into two parts. The first part of the visit was designed to assess the adequacy of the verbal information and advice that would be used in the main study. It was considered that the most appropriate way to introduce the verbal advice was to ask a number of open-ended questions in a semi-structured way. The questions asked related to topics discussed in the booklet, and this procedure provided consistency in each of the visits. Proceeding in this manner allowed the researcher to find out how the children were sleeping, how the parents were getting their children to sleep at night-time and during the day, and what they felt about the way their babies were sleeping. If the parents had other children, they were asked how the sibling/s had slept when younger. Asking such open-ended questions encouraged the parents to talk and discuss their feelings about the way her baby was sleeping. The parents were encouraged to ask questions and to discuss their feelings, beliefs and experiences. When considering the verbal advice, similar advice was given to each client, but the delivery was adapted to take into account individual differences in the families. The verbal information and advice would be consolidated with the written material in the main study.

The delivery of the verbal information and advice in this manner worked well and the plan was to repeat this procedure in the main study.

A copy of the questions that were used to prompt the discussion can be found in Appendix 6.

When the parents in this group were advised of their appointment, a copy of the booklet was enclosed. The participants were asked to read the booklet before the researcher visited and they were told that their comments would be helpful, allowing changes to be made before it was used in a larger study. Participants were asked to make detailed comments on the booklet, and to be as constructively critical as possible. A two-page sheet which allowed their comments to be noted was completed for each participant and this can be found in Appendix 3. The illustrations were discussed one by one and any comments, both positive and negative were noted. Once this discussion of the illustrations was complete comments were elicited on the text included in the booklet, the booklet was discussed section by section.

The comments on the graphics, and the text in each section of the booklet were entered into a computerised database. This allowed easy grouping of the comments, and changes were made as suggested.

Alterations made to the Booklet

The Illustrations

The parents liked the majority of the illustrations. The consensus was that the baby on the outside cover was disliked; this illustration was altered and was eventually taken off the front cover altogether. Changes were suggested to a few of the illustrations to make the baby's head more round and 'baby-like', and these changes were made.

The Text and Layout

The parents were very positive about the content of the booklet. They felt that the booklet was short enough to encourage other parents to pick it up, and that it was detailed and informative. Some of the mothers whose children were sleeping well discussed friends or family that it would have been helpful for. There were three main comments made by the participants. The first was relating to the section on 'dummies'. Mothers stated that they would like some advice on what to do with their child's dummy to prevent it becoming a problem. The other areas commented on were those of settling difficulties and night-waking difficulties. The booklet was designed as a preventive instrument and so treatment had not been discussed in any detail. A majority of the mothers stated that they would like advice on what to do if their child would not go to bed or woke during the night, and so this was added for the main study.

The average length of time taken to complete these pilot visits was one hour. This was not thought to give an accurate indication of how long the visits would take in the main study because much time was taken up discussing the illustrations and text contained in the booklet. It was estimated that visits in the main study would last approximately 45 minutes.

In addition to piloting the booklet with parents of children who were 3 months old, the booklet was shown to a variety of health professionals with experience of health visiting, and therefore of dealing with families with sleep problems. These health professionals did not have health visiting 'caseloads' in the Greater Glasgow Health Board area; this was essential to avoid potential contamination of the control group in the main study. Their comments on the text were very similar to those of the parents, and they were added to the parents comments in the database before changes were made to the booklet. When considering the graphics, a number of the health professionals stated that the baby on page 3 appeared to have a pillow, this is inconsistent with advice for children under one year of age, and so the line under the baby's head was taken out.

4.5. THE INTERVIEW SCHEDULE

Thirteen families agreed to take part in this part of the pilot study which aimed to assess the adequacy of the interview schedule prior to the main study. When they were visited, details of the sleep pattern in the week prior to the visit were taken and an interview schedule was completed by the researcher in each case. A copy of the interview schedule used in the pilot study can be found in Appendix 4. When completing the interview schedule the questions were assessed one by one and any difficulties with wording, understanding, length, ambiguity, sensitivity and flow were documented. Three pages were added to the end of the Interview Schedule and the researcher made comments on each question which were then collated at the end of the pilot study with the assistance of a database. Changes were made to the Interview Schedule as appropriate, and they are discussed below.

Alterations made to the Interview Schedule

Generally the questionnaire appeared to be easily understood by participants and the questions flowed well.

The researcher had not asked parents how they actually got their baby to sleep at bedtime and so this was added. It became apparent that some of the children normally slept well but in the week before the researcher visited the child had been unwell, or had been teething for example. As discussed in Chapter Three, the questions on the childrens' sleep related to the week prior to the researchers visit, and it was therefore decided to add a question which elicited details of the childrens' health in the week prior to the visit.

Question 10 and 14

One significant problem was that night-waking merged with early-waking because of the wording of Question 10 and Question 14. When analysing the data it was important that these two variables be clearly separated and so the wording of Question 10 was changed from 'How many nights in the past week has your baby woken and cried for attention between 10pm and 7am' to 'between 10pm and 5am'. Early waking, as discussed in Question 14 was then determined as any time between 5am and 7am, for the purpose of the study.

Question 13

Question 13 did not offer the choice that the child did not wake and so this was added.

Question 17, 18 and 19

These questions related to the babies naps. The answers supplied in the pilot study showed that the place and the length of time that the babies slept varied greatly between the morning and the afternoon. Parents were often out in the afternoon and the baby therefore slept in the pram or car seat and so the way they got their baby to sleep was different to the morning.

Question 20

The wording of question 20 was found to be too complex and this was simplified for the main study.

Question 21 and 22

Questions 21 and 22 related to the client code and the group code, these were moved to the beginning of the interview schedule.

Question 29

Question 29 was the question relating to the delivery of the baby. The researcher concluded that the category of caesarian section should be divided into elective and emergency section, to allow a more effective comparison of groups in the main study.

Question 32

The final question in the interview schedule proved to be rather sensitive. It was considered by monitoring the mothers non-verbal cues that they felt the researcher was making some sort of judgement if they had not breast-fed their baby. It was considered that this question should be changed with mothers not just being asked if they breast-fed, but rather "if they were bottle-feeding or breast-feeding at present", and then "if they had breast-fed at all". The researcher considered that asking about the bottle-feeding first implied more acceptance of this method of feeding and lowered the sensitivity.

In addition to the details that were completed for each question on the participants understanding, any ambiguities or sensitivities, the researcher completed a written note of what she subjectively felt the response of each client had been, taking into account general comments and non-verbal cues. Participants were generally very happy to take part in the study and comments were positive. The length of time taken to complete each interview was noted. The average length of time was found to be just less than half an hour. This length of time was shorter than had been anticipated, and helped by giving the researcher an indication of how many visits could be carried out per day in the main study.

Coding and Statistical Analysis

The data collected using the Interview Schedules were coded and analysed using the statistical software package Minitab Release 8 (Extended). This process was carried out to allow the researcher to familiarise herself with the software before using it in the main study, it was also intended that any coding problems or results that were difficult to interpret would be highlighted. Question 18 was shown to present a coding problem and was separated into two separate questions.

4.6 ANALYSIS OF POTENTIAL PROCEDURAL PROBLEMS

In addition to allowing the researcher to test the intervention and the method of data collection, it was hoped that the pilot study would highlight any potential procedural difficulties.

The names and addresses of the families were to be supplied by the Greater Glasgow Health Board and it was beneficial for the researcher to know what format these would be supplied in for the main study. Premature babies were to be excluded and carrying out the pilot study gave the researcher an indication of the percentage of babies falling into this category, and therefore helped in the assessment of the total number of names and addresses required.

Finally, the success of the method of arranging appointments was assessed in the pilot study. Parents were asked to indicate on the consent form the best time to visit and the researcher arranged an appointment which corresponded with this. There was a tear-off slip on the appointment letter for parents to return if the time was not suitable. One family asked that the appointment be re-arranged, and one family forgot about the appointment and were out when visited (this appointment was re-arranged by phone). Factors such as these were important when estimating how long it would take to accomplish the 180-200 visits in the main study.

4.7 MILEAGE/TRAVELLING TIME

Finally, the distance travelled to each visit and the time taken to reach each destination was noted. It was essential to gather this information in conjunction with the length of time taken to complete the visits to allow the researcher to assess how many visits could be carried out per day in the main study. It was estimated that four visits could be carried out per day.

CHAPTER FIVE - THE MAIN STUDY

5.1 THE SAMPLE

In the pilot study 37% of the parents of the younger children responded. It was considered that the response rate would be similar in the main study and so, if 500 letters were sent, approximately 185 parents would respond. Although the plan was to send 500 letters, it was estimated from the pilot study that approximately 100 of the supplied names would not be able to be used because of prematurity. The names and addresses of 600 babies were therefore requested from the Greater Glasgow Health Board. Ninety-seven of these babies were born prematurely and so they were excluded. Letters were sent to the parents of the remaining 503 babies, with participants being asked to respond within two weeks. A copy of the letter can be found in Appendix 7. The babies were aged between five weeks and eight weeks when the letters were sent, having been born between the 1st and 20th December 1993.

5.2 THE RESPONSE RATE

The response rate was 33%. One hundred and fifty-five replies were received from families which could be included in the study. Twenty letters were returned by the Post Office marked addressee unknown, five of the mothers replied stating that they would not like to take part in the study and four mothers wrote saying that they would like to take part, but that they were moving out of the city during the months that the study was being conducted. Three mothers wrote agreeing to take part, but they stated on the consent form that their baby had been born prematurely and they were therefore excluded from the study. In these three cases the information supplied by the health board was incorrect. The researcher wrote to these mothers explaining that she was unaware that their babies had been born prematurely, and unfortunately they could not take part. One letter was returned by the Social Work Department stating that the baby was no longer living with its natural mother.

As discussed previously, at least 180 responses were required to allow adequate numbers in the control and experimental groups and so because there were only 155 there was a short-fall of 25 respondents.

5.3 THE ADDITIONAL SAMPLE

When it was obvious that the response rate was too low, discussions took place between the researcher, her supervisors and a statistician in order to decide the most appropriate course of action.

It was considered in-appropriate to send 're-call' letters to the original families, as would be done in a survey to boost the response rate. The mothers were being asked to agree to be visited in their own home, to discuss their child's sleep pattern with the researcher, and they were also to take part in the study for a period of up to seven months (March to October 1994). The mothers all had young babies who would be requiring a lot of attention, and probably taking up much of their time. If mothers did not freely agree to take part when asked initially, it was considered in-appropriate to ask them again.

Another issue of relevance was that previous research has estimated that when re-calling in a survey, the additional response is generally around 6% (Treece & Treece 1986). Re-call letters could have been sent to 315 mothers, if 6% of these mothers then agreed this would produce an additional 19 responses and the response rate would still be too low, as at least 25 were required. Alternatively, if letters were sent to an additional sample, it could be predicted fairly accurately that at least 33% of the mothers would respond.

Considering these two alternatives, it was agreed that the most appropriate action was to write to an additional sample of parents. The low response rate had obvious implications for the generalisability of the results and will be discussed later.

Additional names and addresses were supplied by the Greater Glasgow Health Board on request. The number written to was based on the initial response-rate in the main study. It was assumed that approximately 33% of those contacted would agree to take part. It was therefore estimated that if the researcher wrote to an additional 148 mothers, approximately 44 positive responses should be obtained. Adding this number to the previous responses this should mean that there would be approximately 199 participants, which would be ample for the study.

One hundred and forty-eight letters were sent out. Forty-seven of the responders were able to be used in the study, five letters were returned by the Post Office, one family was moving out of the city and one mother wrote stating she did not wish to take part. Again,

four mothers agreed to take part, but unfortunately their babies were born prematurely and so they were excluded.

The overall response-rate from the fresh sample was 34% (n=47).

5.4 ALLOCATION TO GROUPS

When the respondents from the two samples were added there were 202 replies in total (155 + 47). The families were randomly allocated to either the intervention group or the control group, as discussed in Chapter Three, using random number tables (Pocock 1983, p78 Table 5.4). There were 101 families in each group.

5.5 LETTERS TO THE CONTROL GROUP

The families in the control group would not be visited until August-October. A letter was sent explaining that the researcher would contact them again nearer the time to arrange an appointment. The mothers were asked to let the researcher know if their address changed in the interim.

5.6 THE INTERVENTION

The visits to the intervention group were carried out as planned when the children were 3-4 months old. As previously stated there had initially been 101 families in the intervention group, however, two of the families moved to England and one family withdrew from the study and so 98 families were visited. Appointments were arranged by letter and by telephone.

As in the pilot study, the visits took the form of a semi-structured interview. The questions used to prompt the discussion and the delivery of the verbal information and advice are found in Appendix 8. Questions were asked to enable the researcher to find out about the baby's current sleeping behaviour, the family routine (if any) and settling behaviour. Other questions related to the baby's health and delivery and the sleeping behaviour of any siblings. This semi-structured format allowed two-way conversation between the researcher and the mother, with the mother being able to ask questions and discuss her experience, feelings and beliefs. Each of the questions was designed to allow the researcher to discuss a particular piece of information and advice in the booklet.

It was also hoped that participants with poor reading skills would be able to utilise this information and would be encouraged to attempt reading the booklet if their interest was aroused. A copy of the booklet was left at each visit, with the mothers being encouraged to read it and to let their partners read it and discuss the content. A copy of the booklet is found in Appendix 9.

In general the parents were happy to discuss their child's sleep pattern and they said that they welcomed information on how to encourage their baby to sleep well. The researcher documented her subjective opinion of each visit, taking into account verbal and non-verbal cues. The researcher believed that 6 of the parents did not appear particularly receptive to the health education message.

5.7 DATA COLLECTION

The visits to the intervention group and the control group were interspersed over a period of three months, the families were visited when the children were between eight and ten months old. Appointments were arranged by letter and by telephone. The respondents had no difficulty answering the questions, there appeared to be no problems with interpretation and the delivery of the questions flowed well. A copy of the interview schedule can be found in Appendix 10.

The Intervention Group

Of the 98 families who received the verbal and written information twelve families 'dropped-out' of the study and so data on the sleeping behaviour of the infants was collected from 86 families. Of the twelve families that 'dropped-out' four were excluded due to moderate-severe health problems, four moved house and one withdrew from the study due to work commitments. One family was excluded because of language difficulties. In addition two families were not at home when the researcher visited and despite several attempts the researcher could not contact the families. The drop-out rate was much as anticipated.

The Control Group

There were initially 101 families in this group. Eighteen families 'dropped-out' of the study and so data was collected from 83 families. Four babies were excluded due to moderate-severe health problems, 11 families moved house, 1 family withdrew, and two families

were not at home when visited and the researcher failed to contact them despite numerous attempts. Again, the drop-out rate was much as expected.

5.8 STATISTICAL ANALYSIS

The data from each interview schedule was coded, and then analysed using Minitab Release 8. The results from the analysis are found in the next chapter.

CHAPTER SIX - PRESENTATION OF RESULTS

6.1 THE CHOICE OF STATISTICAL TESTS

The choice of statistical tests was discussed comprehensively in Chapter Three. The Chi-squared Test was used where the data was nominal, or had a nominal element, and the Mann Whitney U Test was used where the data was ordinal.

6.2 THE DEMOGRAPHIC DATA

The demographic data in Section B of the interview schedule were collected in order to test the null hypothesis that: **their was not a statistically significant difference between the demographic characteristics of the control group and the intervention group.** Participants had been randomly allocated to the two groups and so while the demographic characteristics of the groups should not have been significantly different, the collection of this data served as a double-check. If the null hypothesis was not rejected it was considered that it could be inferred that the main difference between the groups was that one group had received the information and advice and the other had not.

When calculating the Chi-squared statistic if there were cells with expected counts of less than 1 the data was grouped in order to produce a valid statistic. This grouping of data will be highlighted wherever it occurred.

The Sex of the Children

The sex of the children was the first area to be compared, and the Chi-squared test was used. Fifty-one percent of the control group sample were boys compared to 44% of the intervention group, and 49% of the control group were girls compared to 56% of the intervention group.

The number of boys and girls was compared between the groups and the difference was not found to be statistically significant ($\chi^2=0.70$, $df=1$, $p=0.41$).

Maternal Age

The distribution of maternal age can be found in **Figure 3**. The data for both the control group, and the intervention group are displayed. The data is ordinal, and so the groups were compared using the Mann Whitney U test.

Figure 3

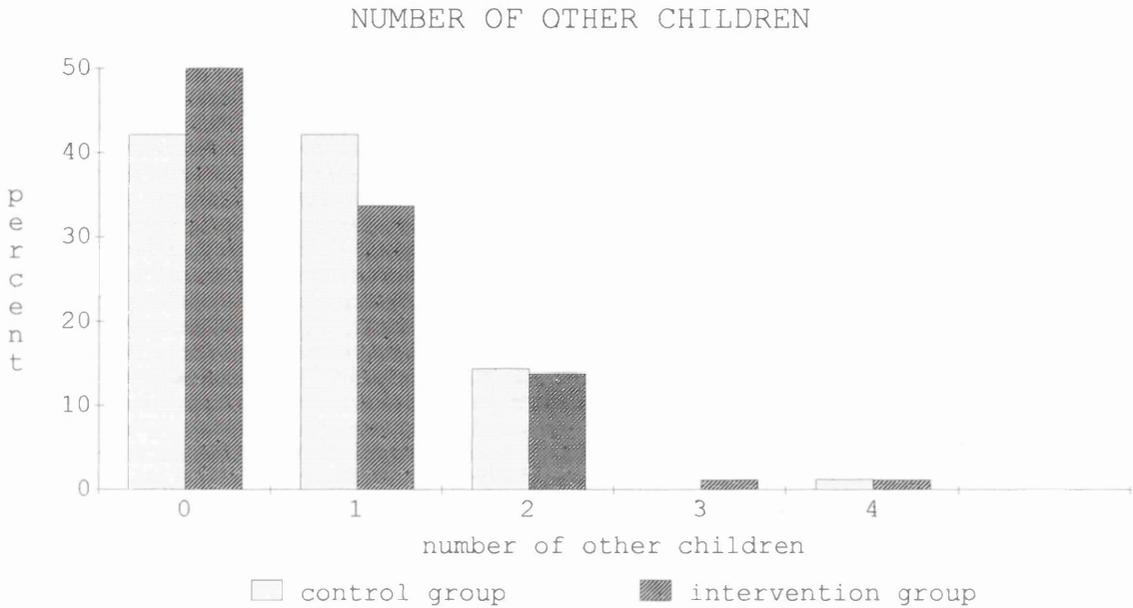


Seventeen percent of the control group were aged 20-24 years compared to 10% of the intervention group. Twenty percent of the control group were 25-29 years old compared to 29% of the intervention group. Although there were differences between the groups, these differences were not large enough to be statistically significant ($p=0.88$, 95% CI for difference in medians:0).

Number of Other Children

Figure 4 shows the percentages of other children in both of the groups.

Figure 4



The data is ordinal and so the groups were compared using the Mann Whitney U test.

Fifty-eight percent of the mothers in the control group had other children and 50% of the mothers in the intervention group had other children.

There was not a statistically significant difference in the number of other children between the groups ($p=0.46$, 95% CI for differences in medians:0).

People Living in the House

Table 1 shows the ages, and number of people living in the houses in both groups.

Table 1

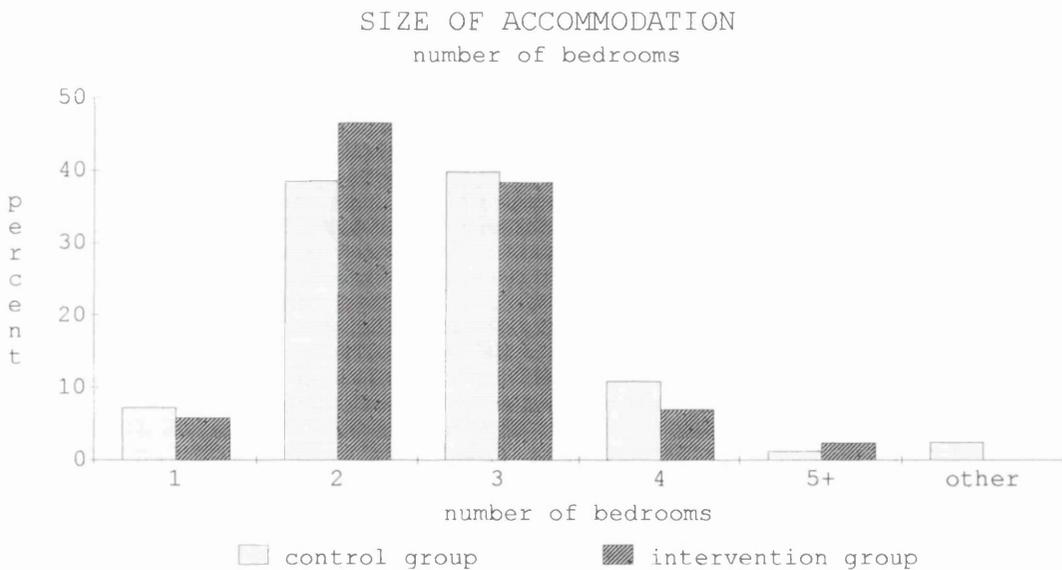
PEOPLE LIVING IN THE HOUSE		
less than 5 years old (including the baby)	control	intervention
one	66.3%	66.3%
two	31.3%	30.2%
three	2.4%	3.5%
between 5 and 16 years	control	intervention
none	69.9%	73.2%
one	21.7%	22.1%
two	7.2%	3.5%
three	1.2%	1.2%
over 16 years of age (including the mother)	control	intervention
one	4.8%	4.7%
two	90.4%	89.5%
three	3.6%	3.5%
four	0.0%	2.33%
five	1.2%	0.0%

The groups were compared using the Chi-squared test. The number of children in the house under 5 years were compared and there was not a statistically significant difference between the groups ($x^2=0.18$, $df=2$, $p=0.91$). The number of children aged 5-16 years were compared and there was not a statistically significant difference between the groups ($x^2=0.99$, $df=2$, $P=0.61$). Initial statistical analysis in this category had shown that there was 1 cell with an expected count of less than 1 and so the categories of two children and three children were grouped to allow computation of the x^2 statistic. Finally, the number of people in the house over 16 years were compared, and again, there was not a statistically significant difference between the groups ($x^2=0.31$, $df=3$, $p=0.96$). In this case initial analysis had shown 3 cells with expected counts of less than 1 and so the categories of four and five people were grouped for the purpose of the analysis.

The Size of Accommodation

The size of accommodation was assessed using the number of bedrooms. The distribution of bedrooms in each group can be found in **Figure 5**. Of those listed under 'other' in the control group, one family were living in a homeless unit, and lived and slept in the same room and one family had one main room, and slept in a bed-recess off this room, the baby slept in the hall. Using the Chi-squared Test, the groups were found to be similar in respect of the number of bedrooms in the house ($\chi^2=1.73$, $df=4$, $p=0.78$). Initial statistical analysis had shown that there was 1 cell with an expected count of less than 1 and so the data listed under 'other' was grouped with that listed under 1 bedroom.

Figure 5



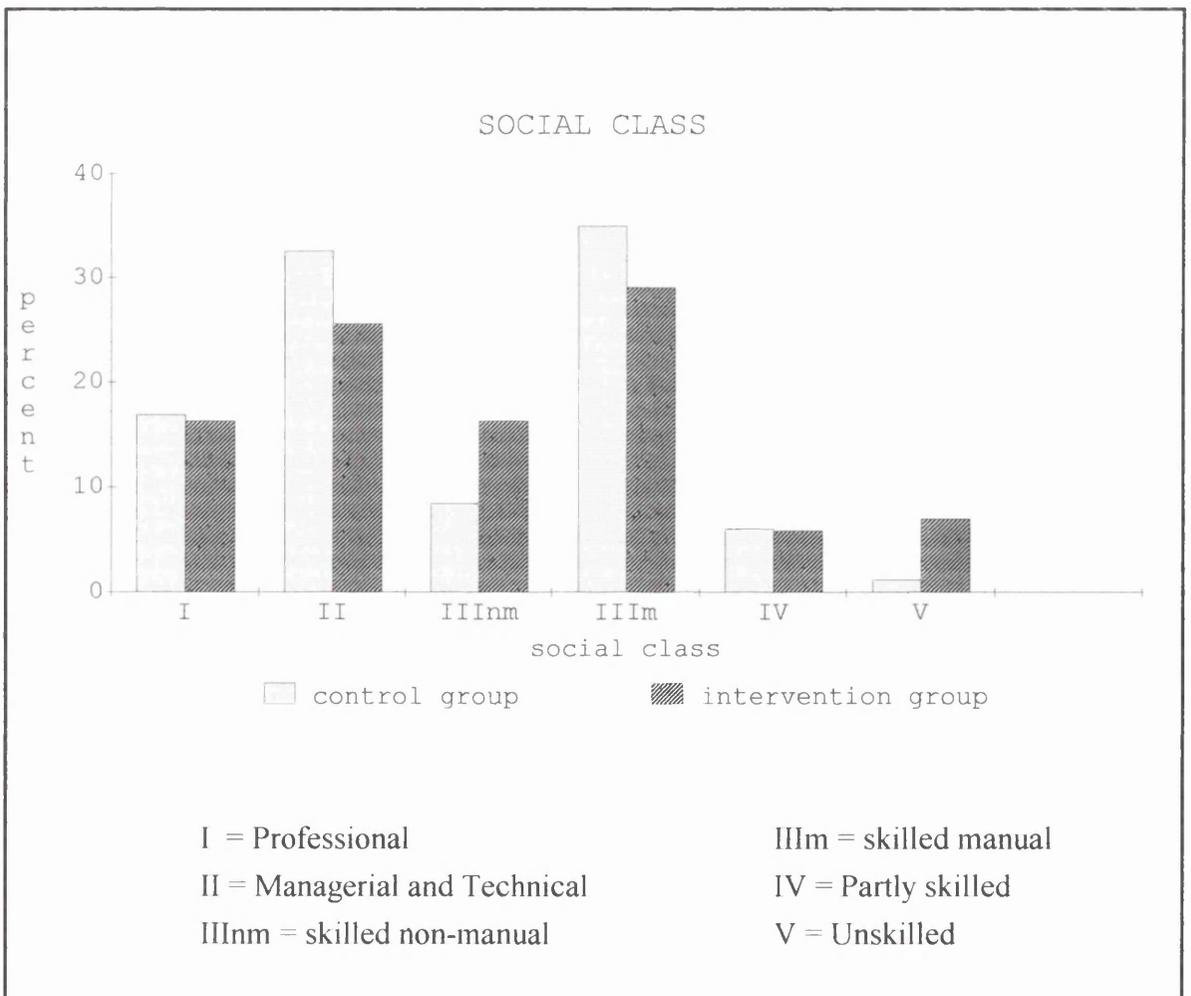
No attempt was made to define overcrowding, this would have been complicated, and also would have suffered from the subjectivity of the researcher and the participant. The number of bedrooms in each group was cross-tabulated with the number of people living in each house, and using the Chi-squared Test, and there was not a statistically significant difference between the groups (p values varied from 0.33-0.81).

Social Class

The social class of the families participating in the study was determined using standard occupational classification (OPCS 1991).

Figure 6 shows a comparison of social class between the groups. Thirty-three percent of the control group were in Social Class II, which is the managerial/technical category, compared to 24% of the intervention group. One percent of the control group were in Social Class V, which is the unskilled category, compared to 7% of the intervention group. The differences between the groups were not found to be statistically significant. ($\chi^2=6.93$, $df=5$, $p=0.23$).

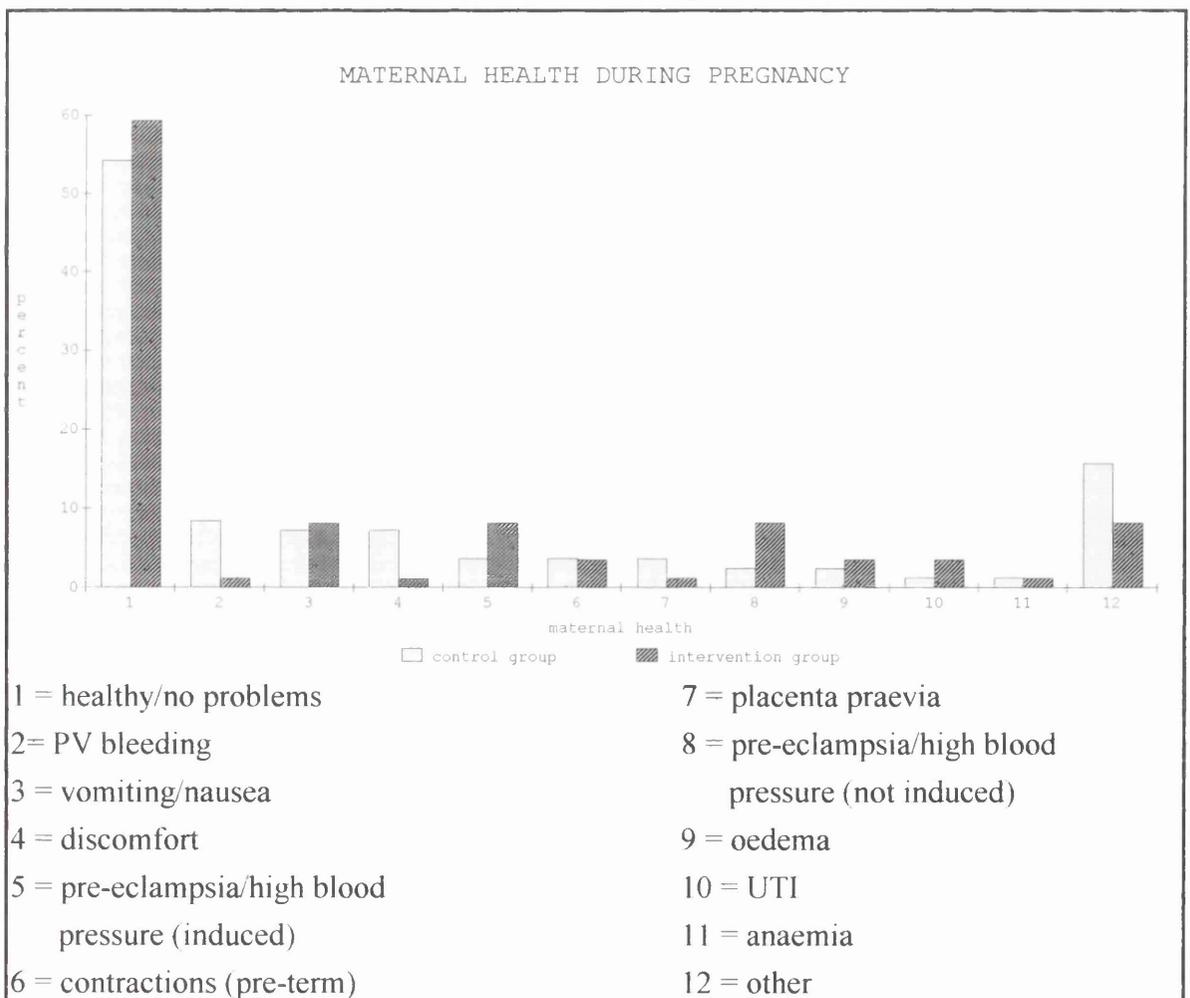
Figure 6



Maternal Health During Pregnancy

The mothers were asked if they were well during their pregnancy. If they had any problems with their health they were asked to provide details, the results are seen in **Figure 7**. It is recognised that the concept of health and 'problems with health' is very subjective, and a condition that one mother may consider a problem another may not. Another important element is that of memory, some of the mothers may have had a more accurate recall of obstetric problems than others. Finally, some of the mothers would have had a better understanding of obstetric complications than others, and so may have conveyed in a more accurate way to the researcher what the problems were. These factors were not considered to be problematic because of the random selection of the groups. No attempt was made by the researcher to classify what was a minor, moderate, or severe problem.

Figure 7



This was an open question, details were taken from each mother, and a coding frame was developed by analysing the replies. The coding frame, and coding system was independently checked by two other researchers. The mothers could have suffered from more than one condition, and so the χ^2 statistic was calculated for each condition separately. The comparison of the groups demonstrated a statistically significant difference in one category. More of the mothers in the control group complained of 'a lot of discomfort' during their pregnancy, this was 7% compared to 1% in the intervention group ($\chi^2=3.91$, $df=1$, $p=0.05$). 'Discomfort' is obviously very non-specific, and this term covered, backpain, abdominal pain, sciatica and pain from a separated symphysis pubis. Those listed under 'other' suffered from low blood pressure, asthma, hyperthyroid, varicose veins and chicken pox.

Method of Delivery

The method of delivery was compared between the groups, the results can be seen in **Table 2**.

Table 2

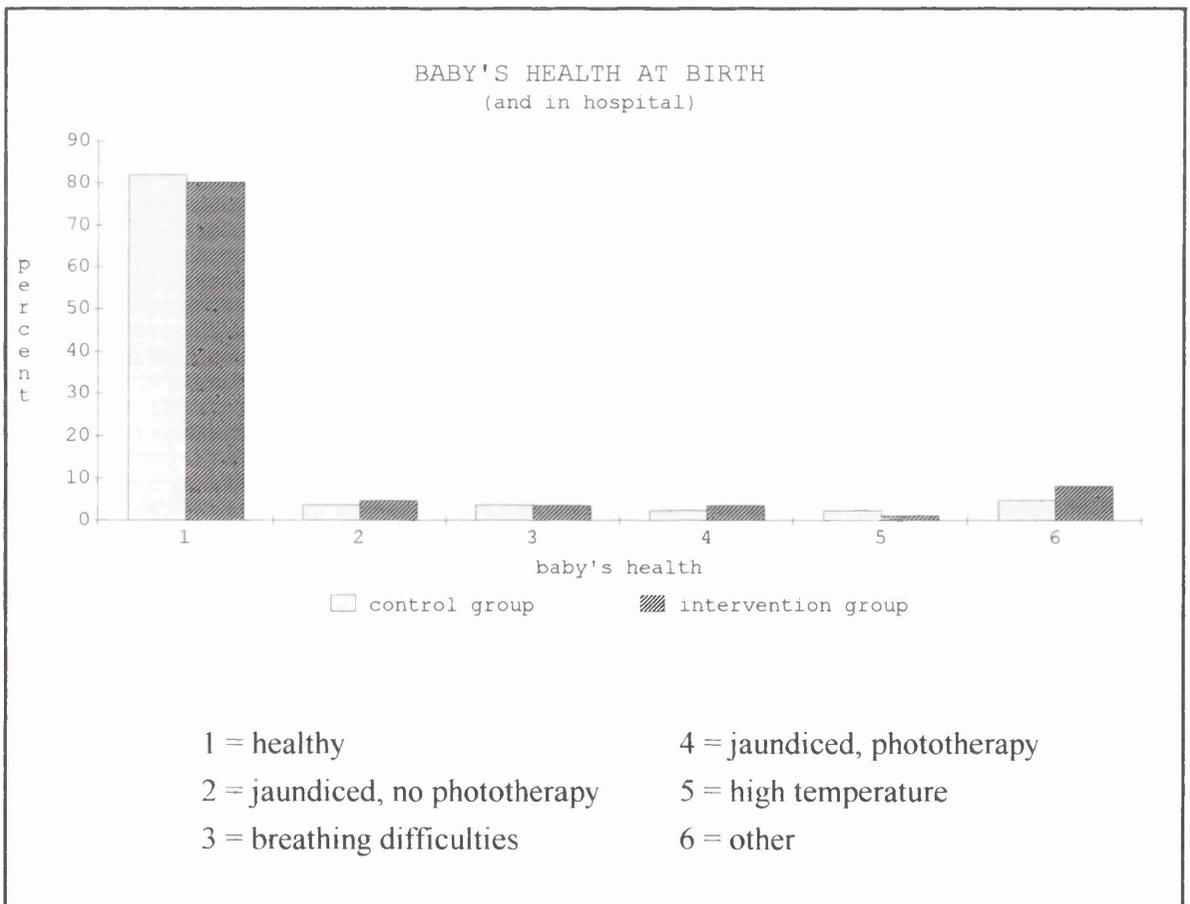
METHOD OF DELIVERY		
	control	intervention
normal	69.9%	74.4%
forceps	8.4%	14.0%
ventouse	1.2%	2.3%
caesarian section		
elective	12.1%	3.5%
failure to progress	1.2%	1.2%
emergency	7.2%	4.6%

As can be seen, more babies were born by caesarian section in the control group than in the intervention group. In total 20.5% were born by this method in the control group, compared to 9.3% in the intervention group. Although there is a difference between the groups, the difference was not statistically significant ($\chi^2=5.96$, $df=4$, $P=0.2$). There was 1 cell with an expected count of less than 1, and so 'emergency' caesarian sections, and those due to 'failure to progress' were grouped.

Baby's Health at Birth

The mothers were asked if their baby was well when he/she was born, and during his/her stay in the maternity hospital. If there were any problems they were asked to give details. This was an open question, with the coding frame being developed by analysing the replies. The coding frame and method of coding was checked by two independent researchers. The babies could have suffered from more than one condition and so the χ^2 statistic was calculated for each condition. There was not a statistically significant difference between the groups in any of the areas (p values ranged from 0.38-0.96). **Figure 8** shows the results, those listed under 'other' had low blood sugar and E anti-bodies.

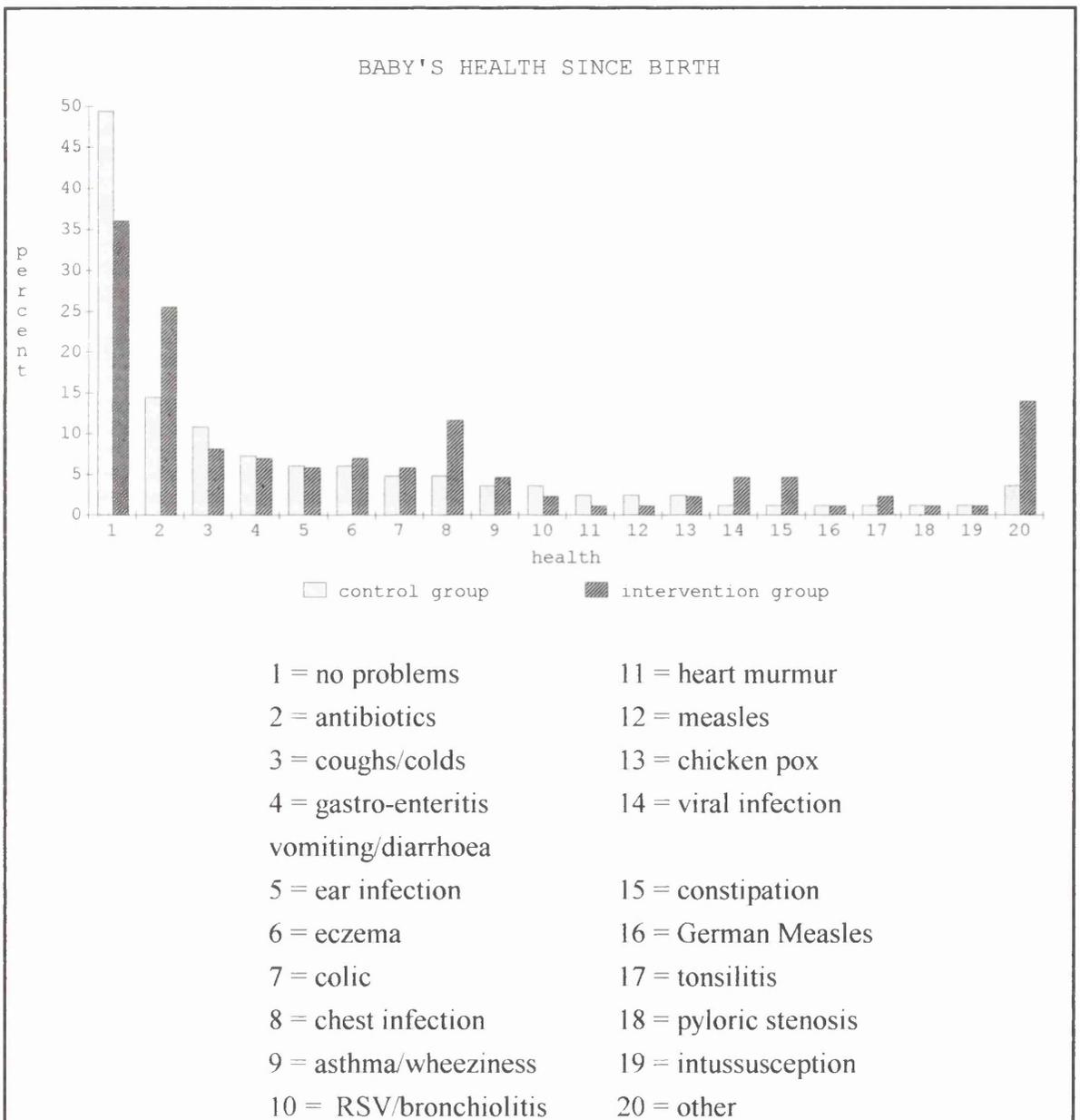
Figure 8



Baby's Health Since Birth

The mothers were asked to state if their child had any problems with his/her health since birth. If the answer was yes, they were asked to give details. Again this was an open question and the coding frame was checked, the results are seen in **Figure 9**. The children could have suffered from more than one condition and so the χ^2 statistic was calculated for each condition separately.

Figure 9

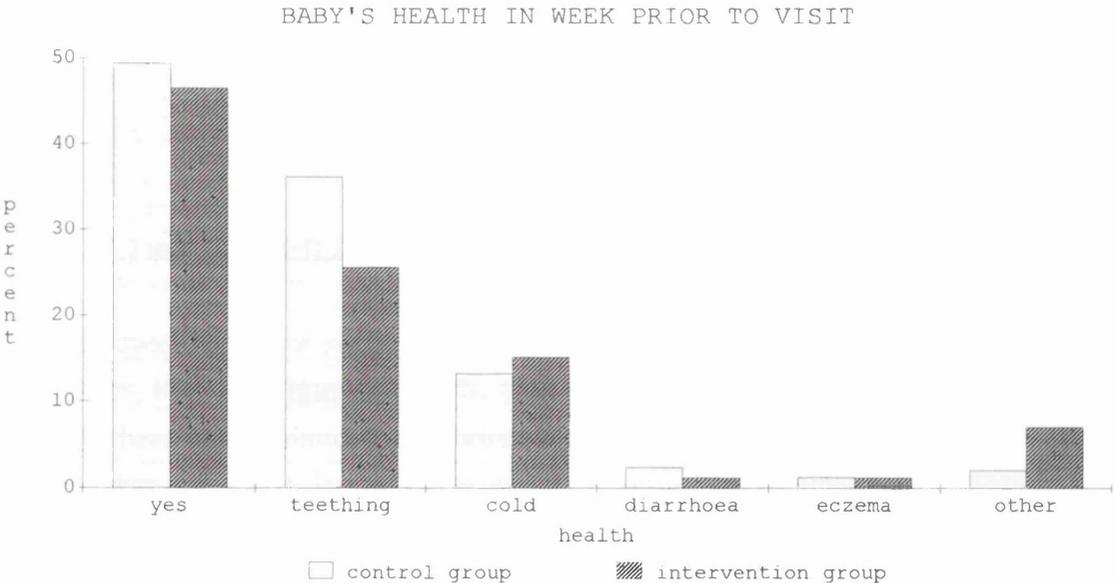


There was a statistically significant difference between the groups in respect of the health of the children in only one category. There were less children with health problems listed under 'other' in the control group than in the intervention group, this was 4% compared to 14% ($\chi^2=4.68$, $df=1$, $p=0.03$). Some of the problems listed under 'other' include breast-milk jaundice, rectal abscess, allergies, impetigo, fungal infection of face and congenital dislocation of the hip.

The Baby's Health in the Week Prior to Data Collection

The mothers were asked to give details of their baby's health in the week prior to data collection. This was important because illness, or pain due to teething for example could have had an affect on the baby's sleep pattern. **Figure 10** shows a comparison of the groups, their was no significant difference between the groups (p values ranged from 0.10-0.73). Those conditions listed under 'other' included measles, chicken pox and a viral infection.

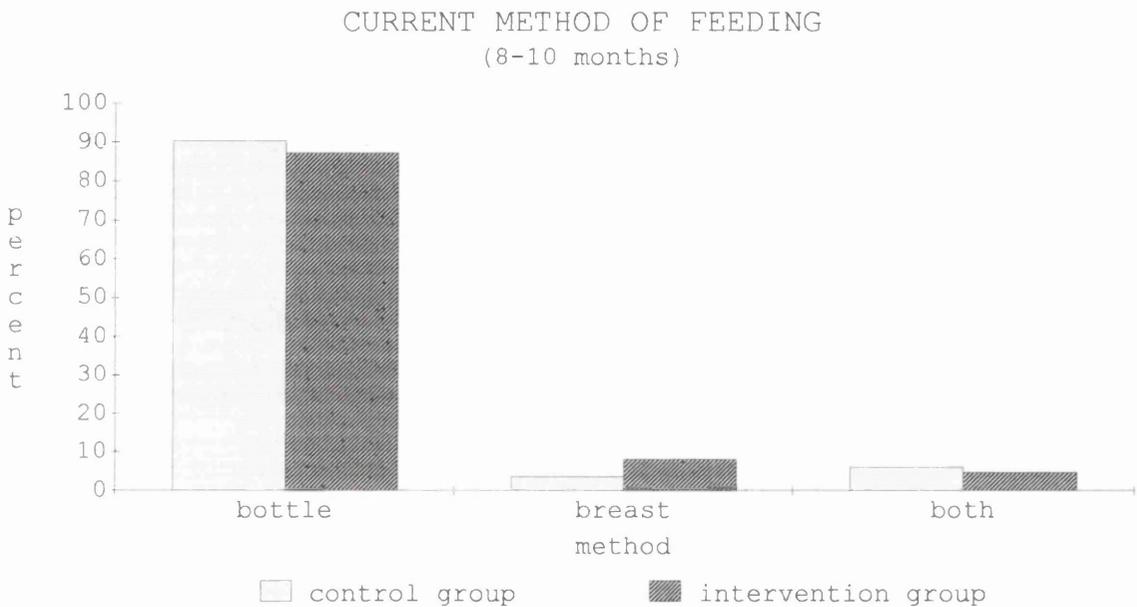
Figure 10



Method of Feeding when Visited

Figure 11 shows the method of feeding in both groups. In the control group 9.63% of the mothers were either breast-feeding or breast and bottle-feeding compared to 12.79% in the intervention group. This difference in the groups was not statistically significant ($\chi^2=1.66$, $df=2$, $p=0.44$).

Figure 11

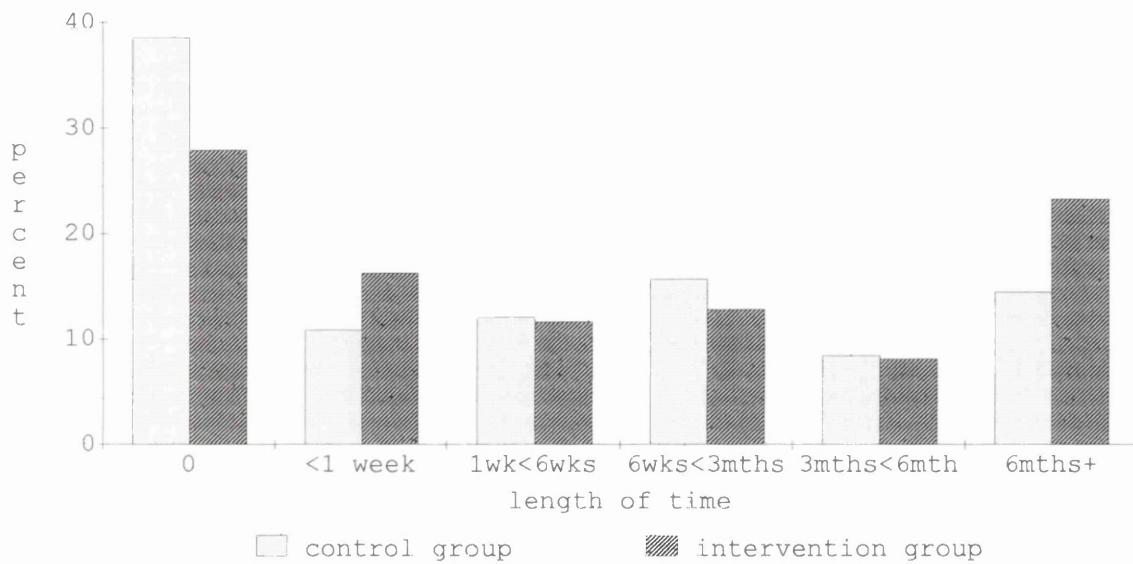


Length of Time Breast-fed

The final question in this section related to the length of time that the mothers breast-fed their babies, if at all. **Figure 12** on the next page shows the results. A smaller percentage of the mothers in the control group breast-fed their babies than in the intervention group. Of those that breast-fed, less of the mothers in the control group fed for three months or longer. The data was ordinal and so the groups were compared using the Mann Whitney U Test. The difference in the groups was not statistically significant ($p=0.16$, 95% CI for difference in medians: 0 to 1).

Figure 12

LENGTH OF TIME BREAST-FED



6.3 THE SLEEP DATA

The data in Section A of the Interview Schedule were collected to test the null hypothesis that: **there was not a statistically significant difference in the sleeping behaviour of the control group and the intervention group.**

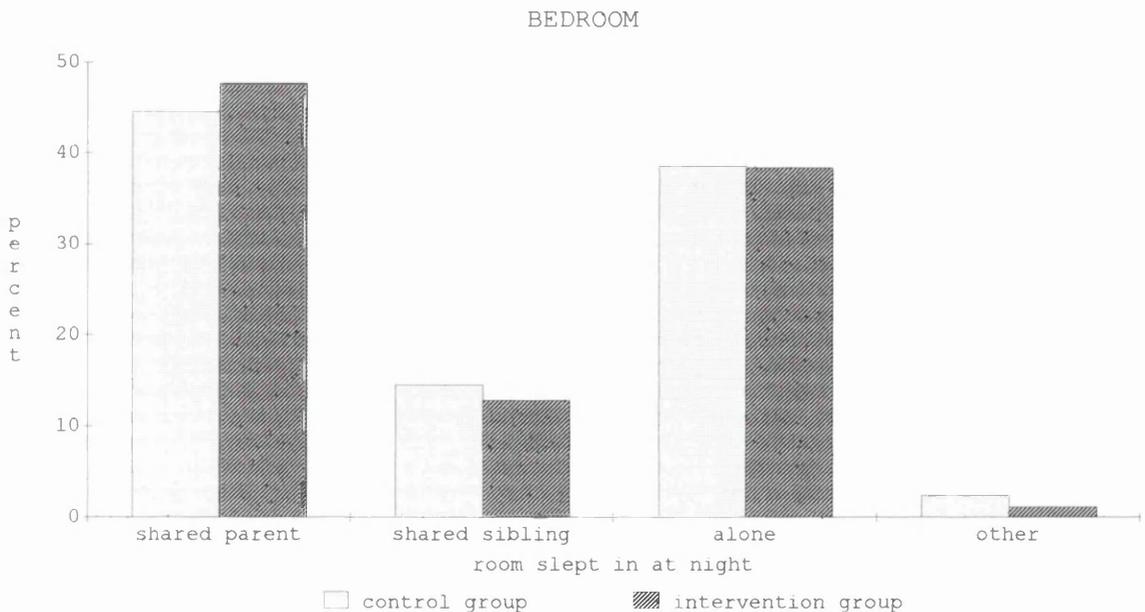
The results relating to the sleeping behaviour are divided into four main sections, settling behaviour, night-waking, early-waking and naps. At the end of this section the parents were asked to indicate on a Semantic Differential Scale how they felt about the way their baby was sleeping.

SETTLING BEHAVIOUR

Bedroom

The first question in this section related to the room that the baby slept in for all or most of the night. A comparison of the groups can be found in **Figure 13**. The differences between the groups were assessed using the Chi-squared Test, and were not found to be statistically significant ($\chi^2=0.54$, $df=3$, $P=0.9$).

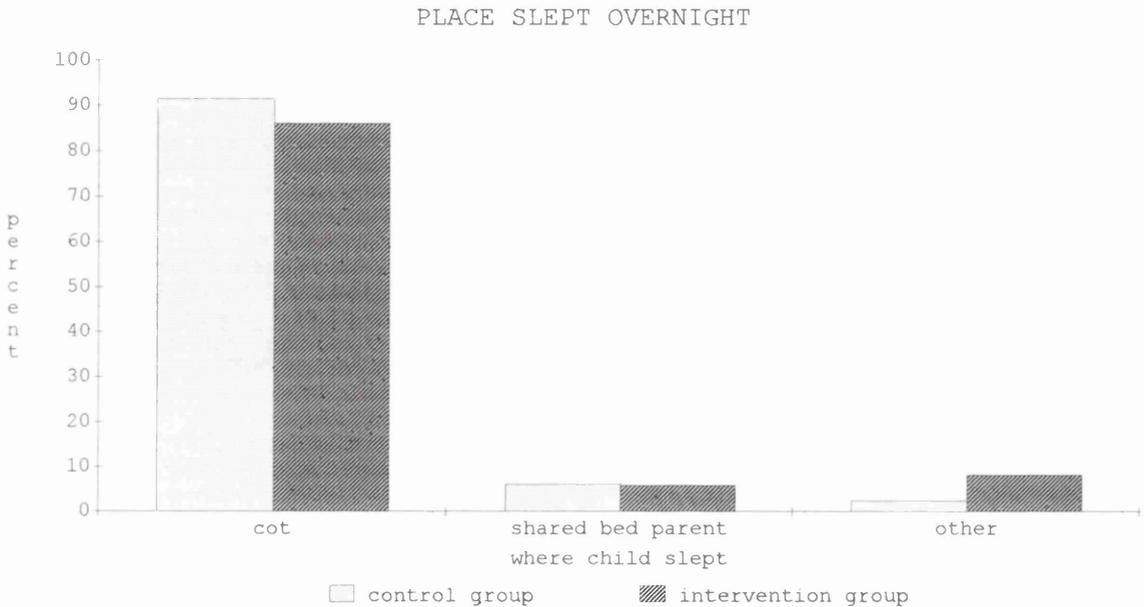
Figure 13



Bed/Place Baby Actually Slept

Figure 14 shows the bed that the babies actually slept in. As can be seen, the vast majority of babies slept in a cot for most or all of the night. The percentage that shared their parents' bed was identical in each group. Some of the places listed under 'other' included a pram, a travel-cot, a carry-cot, a single bed and a mattress on the floor. Using the Chi-squared Test, the differences between the groups were not found to be statistically significant ($\chi^2=2.75$, $df=2$, $p=0.25$).

Figure 14

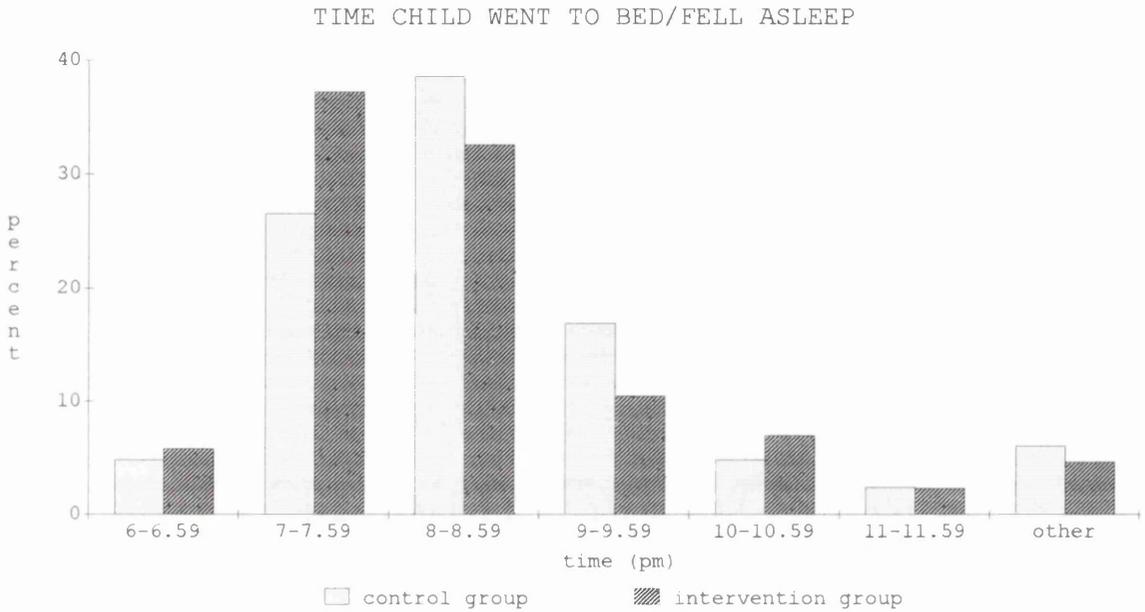


Ninety-three percent of both the control and intervention groups slept where their parents intended them to at the beginning of the night..

Time Baby went to Sleep at Night

Figure 15 shows the time that the babies went to sleep most nights.

Figure 15



Slightly more of the babies in the control group went to bed/sleep after 9pm compared to those in the intervention group. Of those listed under 'other' one baby went to bed at 5.15pm every night and the others did not have a set bedtime. The groups were compared using the Chi-squared Test, and there was not a statistically significant difference between the groups in respect of the time the babies went to bed/sleep ($\chi^2= 3.78$, $df=6$, $p=0.71$).

The parents were asked whether their baby went to bed at the time they intended most nights. The majority of children went to bed/asleep within an hour of the time their parents wanted them to, this was 83% in the control group and 94% in the intervention group.

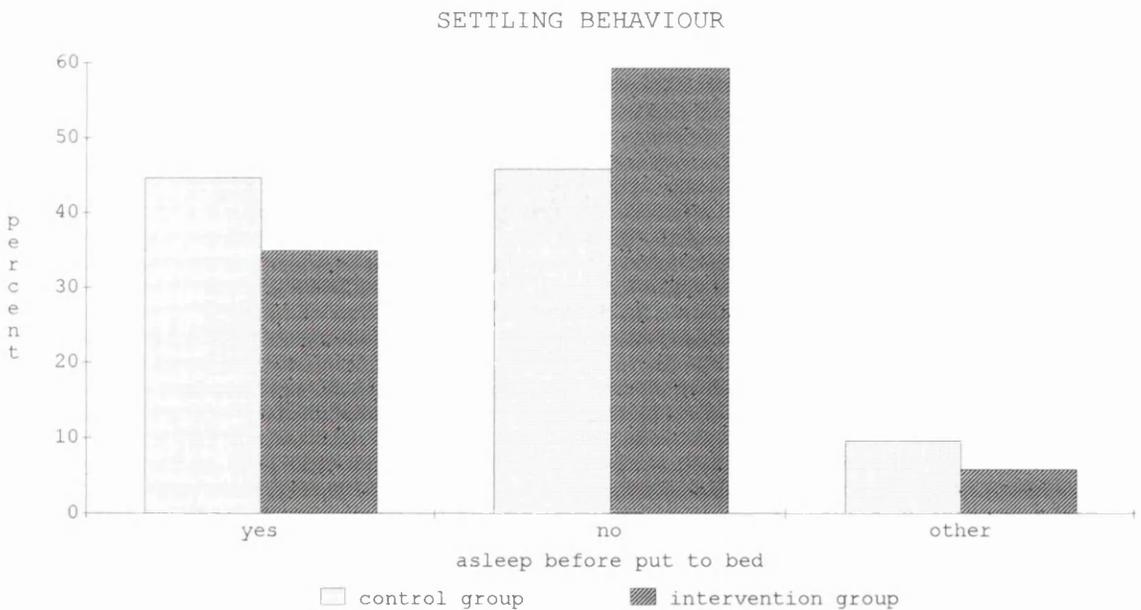
Of those that did not go to bed when their parent/s intended 36% of the control group tried to get their baby to bed/sleep compared to 64% of the intervention group. There was a significant difference between the groups ($\chi^2= 5.86$, $df=2$, $p=0.05$).

Asleep Before Put to Bed

The parents were asked whether their child was normally asleep before he/she was put to bed. **Figure 16** shows the comparison between groups. There was a 10% difference between the groups, with 45% of the control group being asleep before being put to bed compared to 35% of the intervention group, this difference was not statistically significant ($\chi^2=3.27$, $df=2$, $p=0.20$).

Of those listed under 'other', the majority of parents stated that their child was put to bed both awake and asleep, with neither being more common than the other. Two mothers in the control group and two of the mothers in the intervention group put their baby to bed awake, but lay down with him/her until he/she fell asleep.

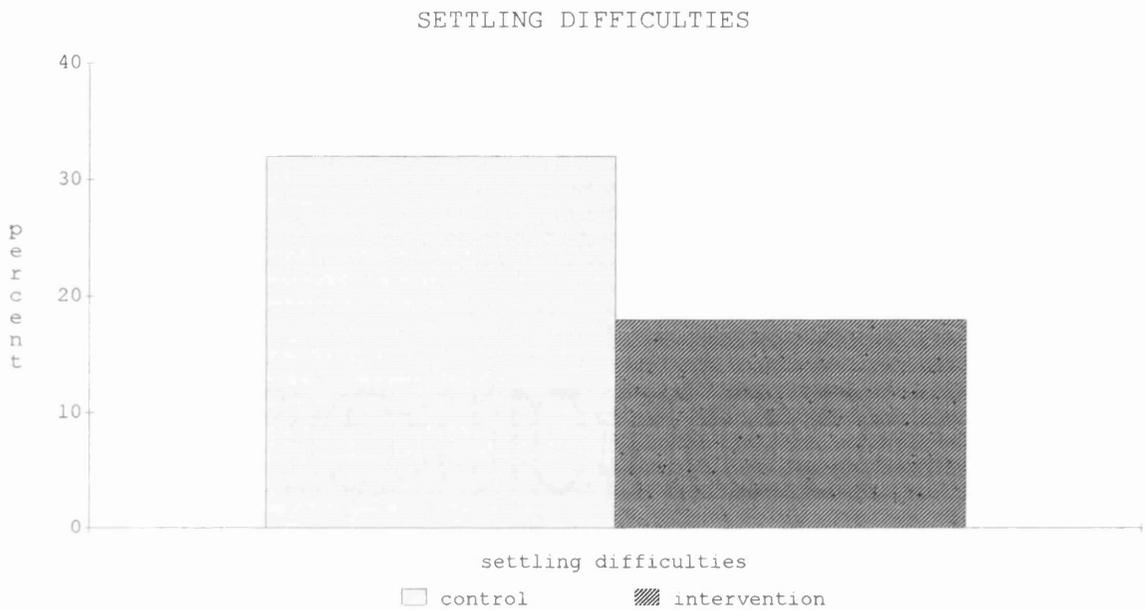
Figure 16



Reason that Baby was Asleep when Put to Bed

The mothers were asked to tell the researcher why they settled their baby to sleep before they put him/her to bed. The results can be seen in **Figure 17**.

Figure 17



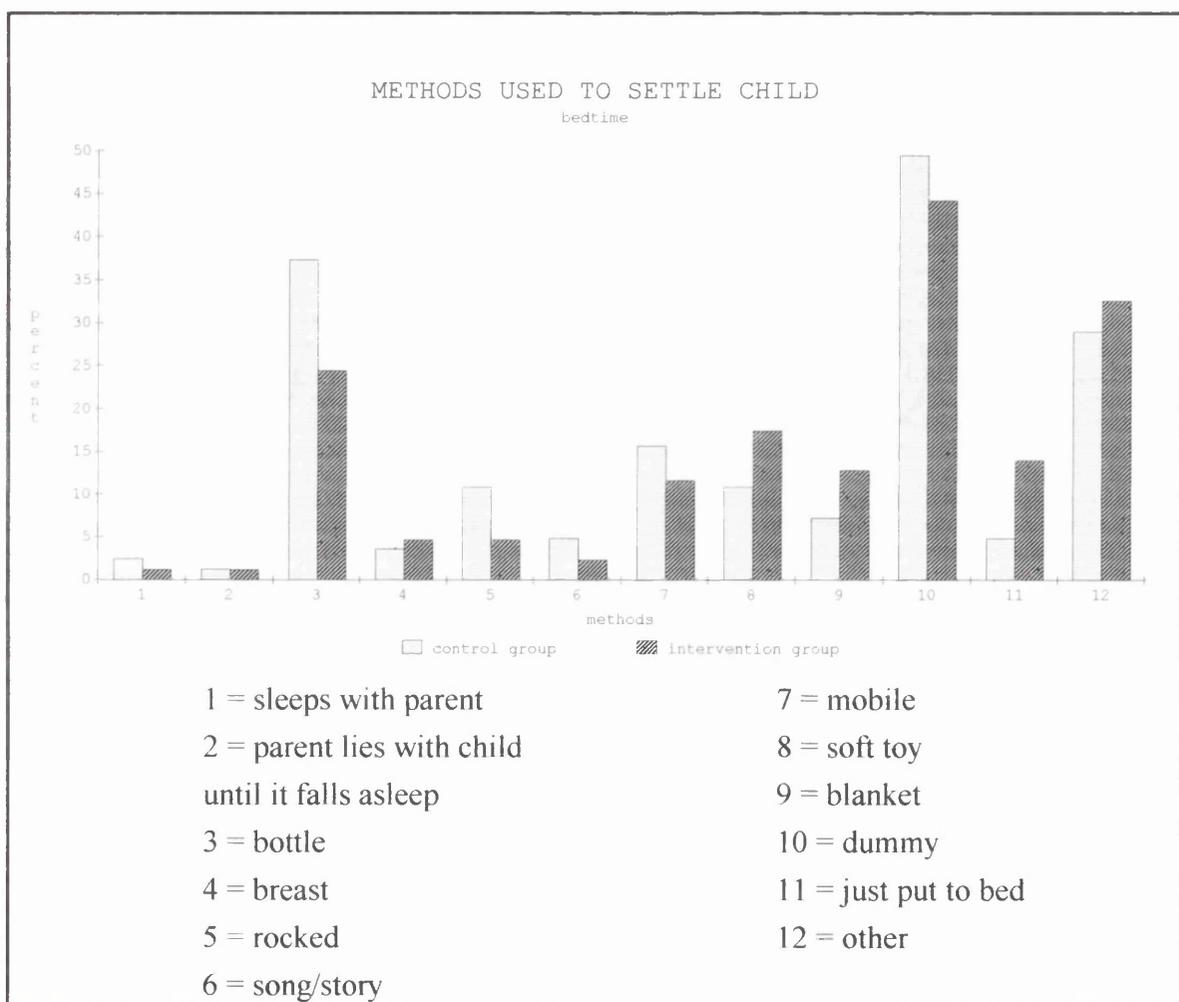
Thirty eight percent of the control group compared to 21% of the intervention group stated that they could not get their baby to fall asleep in its cot and so they had to get the child to sleep before putting it to bed. This difference between the groups was assessed using the Chi-squared Test and was found to be statistically significant ($\chi^2=4.88$, $df=1$, $p=0.03$).

Of those that fell asleep before being put to bed, the majority fell asleep in the living room, this applied to 72% of the control group and 85% of the intervention group. Most of the children were asleep for less than fifteen minutes before being put in their bed.

Methods used to Settle Child to Sleep

The parents were asked to specify how they actually encouraged their child to fall asleep. **Figure 18** shows the different methods. Many of the parents employed more than one method, for example rocking and singing to the baby.

Figure 18



As can be seen the most common ways of encouraging the babies to fall asleep were to give them a bottle and/or to give them a dummy. The χ^2 statistic was computed separately for each method of settling because the parents may have used more than one to get their

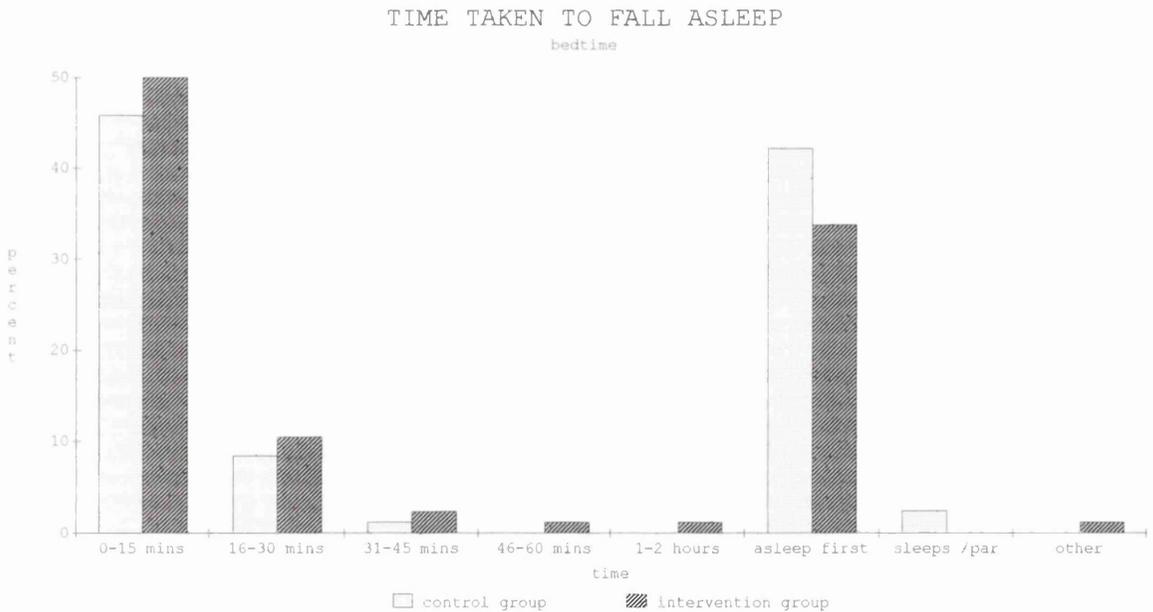
child to sleep. There was a statistically significant difference between the groups in one category, and this was the number of children that were 'just put to bed'. Fewer babies in the control group were 'just put to bed' than in the intervention group ($\chi^2=4.11$, $df=1$, $p=0.04$).

It is of note that a larger proportion of the children in the control group were bottle-fed to encourage them to fall asleep than in the intervention group, this was 37% compared to 24%. This difference did not, however, reach statistical significance ($\chi^2=3.32$, $df=1$, $p=0.07$). There was no great commonality in the methods listed under 'other', with 'strokes face', 'paces the floor', 'holds hand' and 'sucks fingers' being just a few of the methods listed.

Time Taken to Fall Asleep

The parents were asked to state how long it took for their child to fall asleep in his/her own bed at night. **Figure 19** shows the average length of time taken for the babies to fall asleep in both groups.

Figure 19



The greatest number of children fell asleep within fifteen minutes of being put to bed. As has been stated in a previous question a large number of children did not fall asleep in their

own bed. There was no significant difference in the length of time that the babies took to fall asleep ($\chi^2=0.48$, $df=4$, $p=0.52$). Initial statistical analysis had shown that there were a number of cells with an expected count of less than 1, and so the three time spans between 31 minutes and 2 hours were grouped, and 'sleeps with parent' and 'other' were grouped.

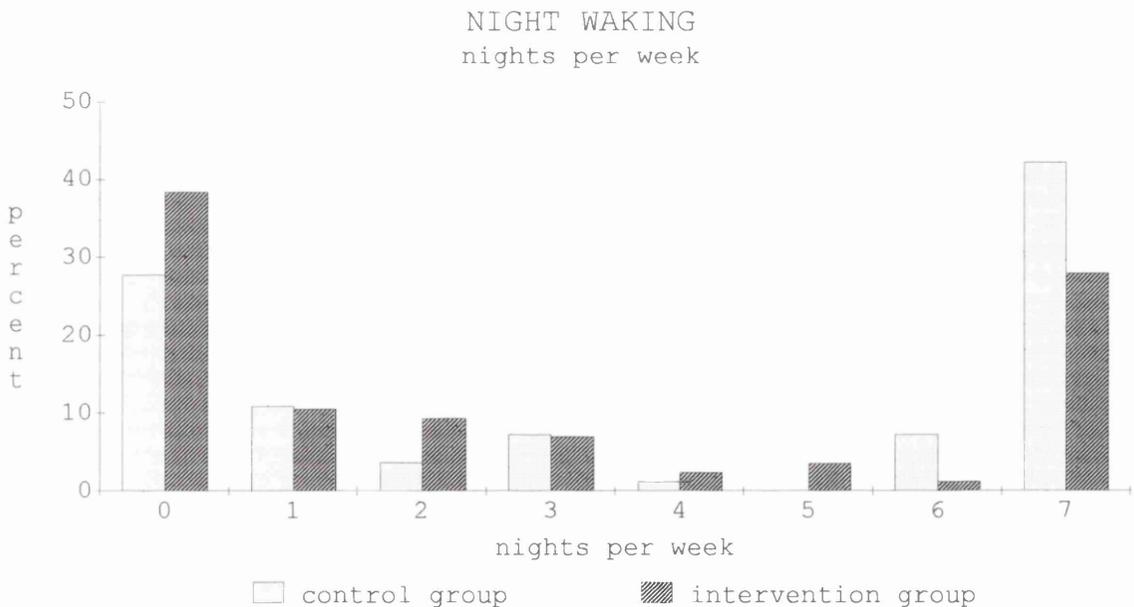
NIGHT WAKING

Night waking was the second main section that was analysed when comparing the sleeping behaviour of the two groups.

Nights per week

The first question relating to night waking detailed the number of nights in the week before the researcher visited that the babies woke. **Figure 20** shows the results.

Figure 20

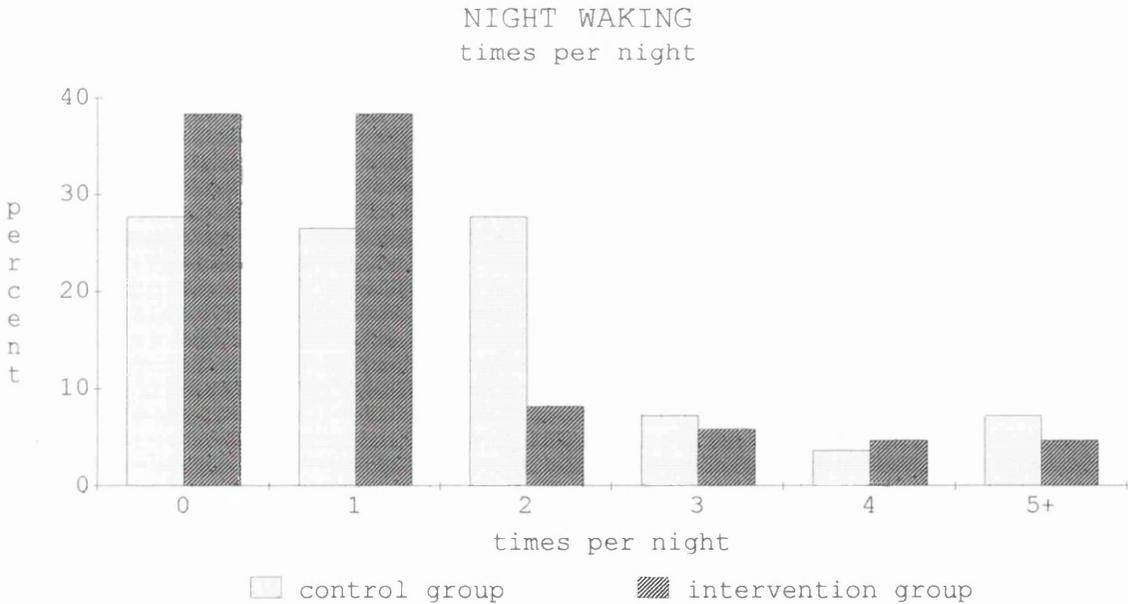


The data is ordinal and so the Mann Whitney U Test was used to compare the groups. As can be seen, less of the control group did not wake at all, and more of the control group woke every night in the week before visited. The median of the number of nights the babies in the control group woke was four nights, compared to two nights in the intervention group. There was a statistically significant difference between the groups, ($p=0.04$, 95% CI for difference in medians: 0 to 1).

Times Per Night

The number of times per night that the babies woke was also assessed using the Mann Whitney U Test. **Figure 21** shows the difference between the groups. Forty-six percent of the control group woke two or more times per night, compared to 23% in the intervention group. The difference in the groups was statistically significant ($p=0.02$, 95% CI for difference in medians: 0 to 1).

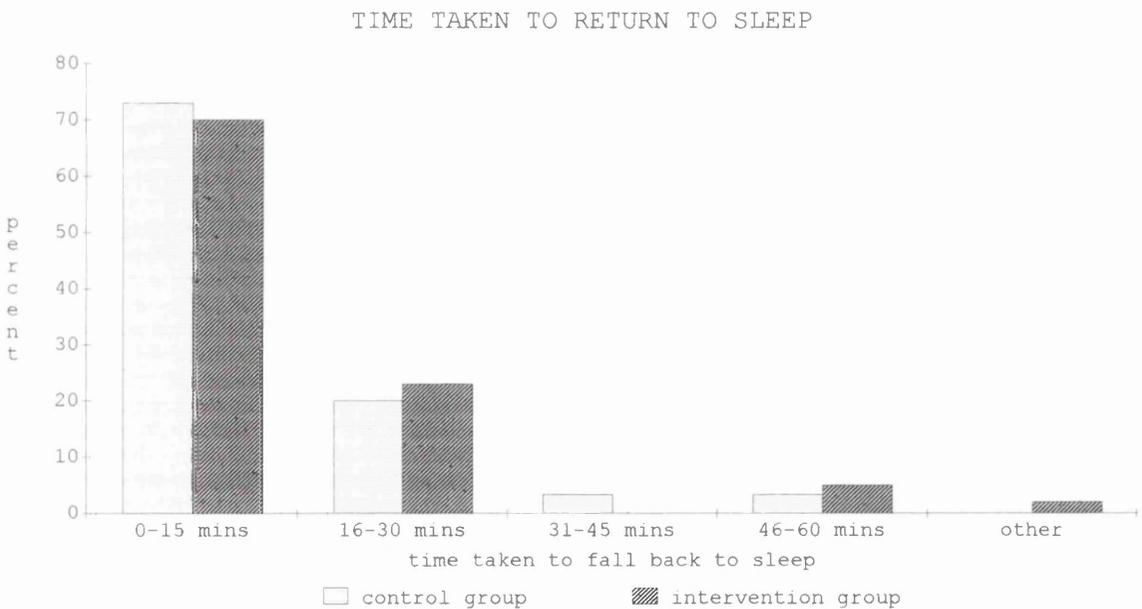
Figure 21



Length of Time Awake

The parents were asked to state how long it took for them to get their child back to sleep at night. The majority of children in both groups were back to sleep again within 15 minutes, this applied to 73% of the control group, and 70% of the intervention group. A comparison of the groups can be seen in **Figure 22**. There was no significant difference between the groups ($\chi^2=0.17$, $df=2$, $p=0.92$). There were a number of cells with expected counts of less than 1, and so 31-45 minutes, 46-60 minutes and 'other' had to be grouped in order to produce a valid χ^2 statistic.

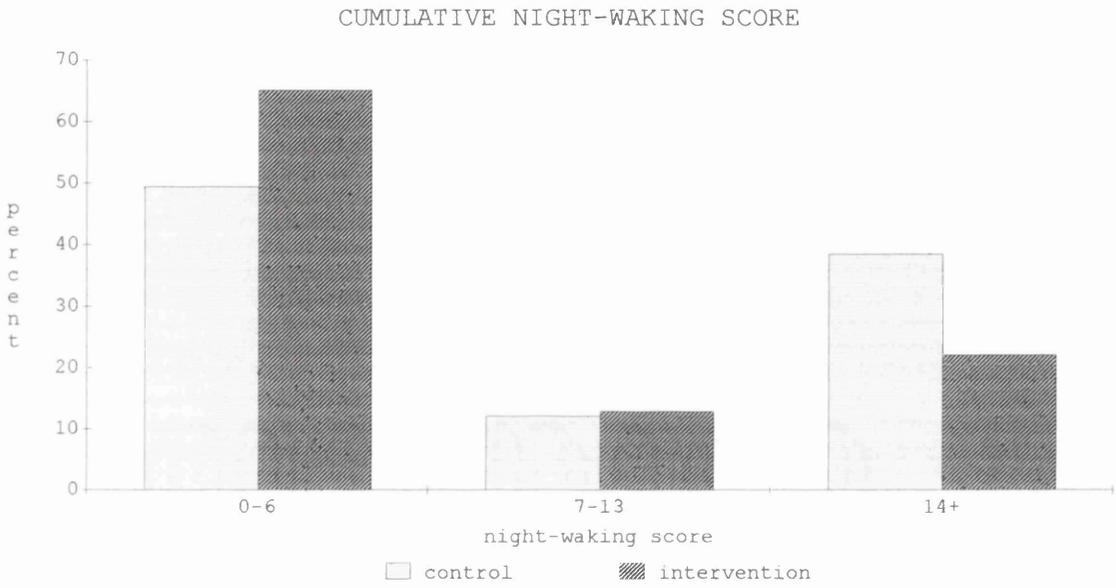
Figure 22



A **Cumulative Sleep Score** was developed which combined the three elements of night waking: the number of nights per week the child woke, the number of times per night, and the length of time that the child was awake. The sleep score awarded one point for each night that the child woke in the week, one point was awarded for each time that the child woke per night, and one point was awarded for each quarter of an hour that the child was awake. The scores for each of the three areas were multiplied to produce the final score.

Figure 23 demonstrates the results that the sleep score produced. A significant difference emerged between the groups, 39% of the control group had a score of 14+ compared to 22% in the intervention group ($p=0.03$, 95% CI for difference in medians: 0 to 1). The median score in the control group was 12 compared to 7.5 in the intervention group.

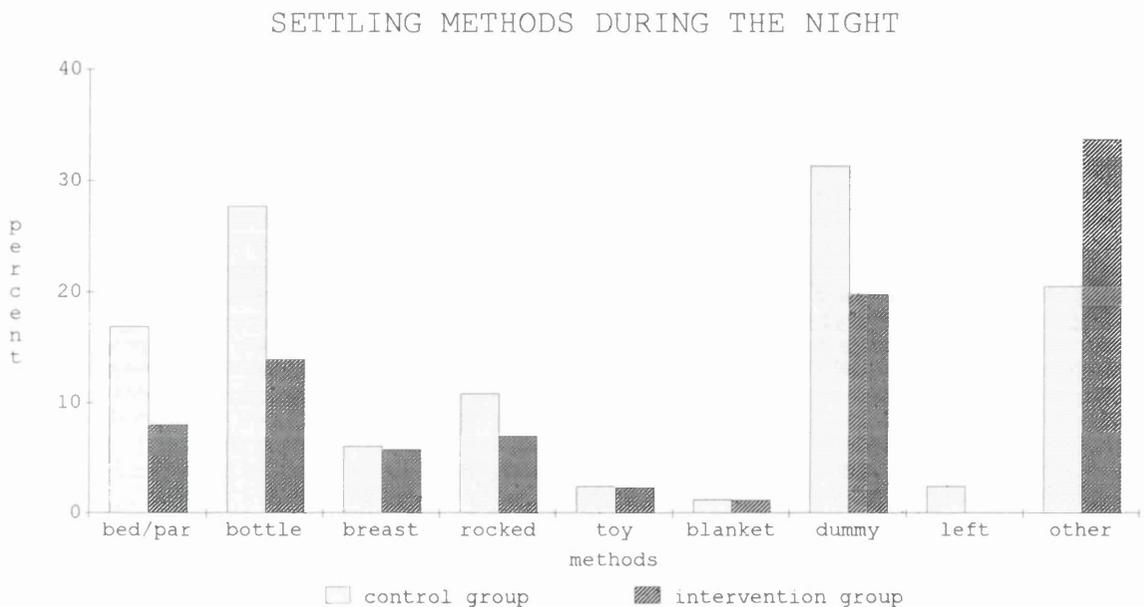
Figure 23



Methods Used to get Baby Back to Sleep

In general, parents adopted strategies for getting their baby back to sleep as quickly as possible. Although most of the babies settled back to sleep in less than 15 minutes, they were not necessarily back to sleep in their own bed, and they were often fed until they fell asleep. **Figure 24** shows the different methods used to encourage the babies to fall back to sleep.

Figure 24



Parents may have used more than one method to settle their child and so the χ^2 statistic was calculated for each settling method separately. The most commonly adopted method for settling the babies back to sleep was to feed them. In total, 34% of the control group, compared to 20% of the intervention group fed their babies to get them back to sleep. Twenty-eight percent of the babies were bottle-fed in the control group compared to 14% in the intervention group. This difference between the groups was statistically significant ($\chi^2=4.87$, $df=1$, $p=0.03$).

The second most popular way of encouraging the babies to return to sleep was to give or replace a dummy. Thirty-one percent of the parents in the control group used this method, compared to 20% in the intervention group. This difference between the groups did not reach statistical significance ($\chi^2=2.97$, $df=1$, $p=0.08$).

The third most popular way of settling the babies back to sleep was to take them into bed with the parent/s, this method was employed by 17% of the control group and 8% of the intervention group. Again, the difference between the groups did not reach statistical significance ($\chi^2=2.96$, $df=1$, $p=0.08$). Those methods listed under 'other' included 'changing the baby's position', 'tucking the baby in', 'winding the baby' and 'nappy changing'

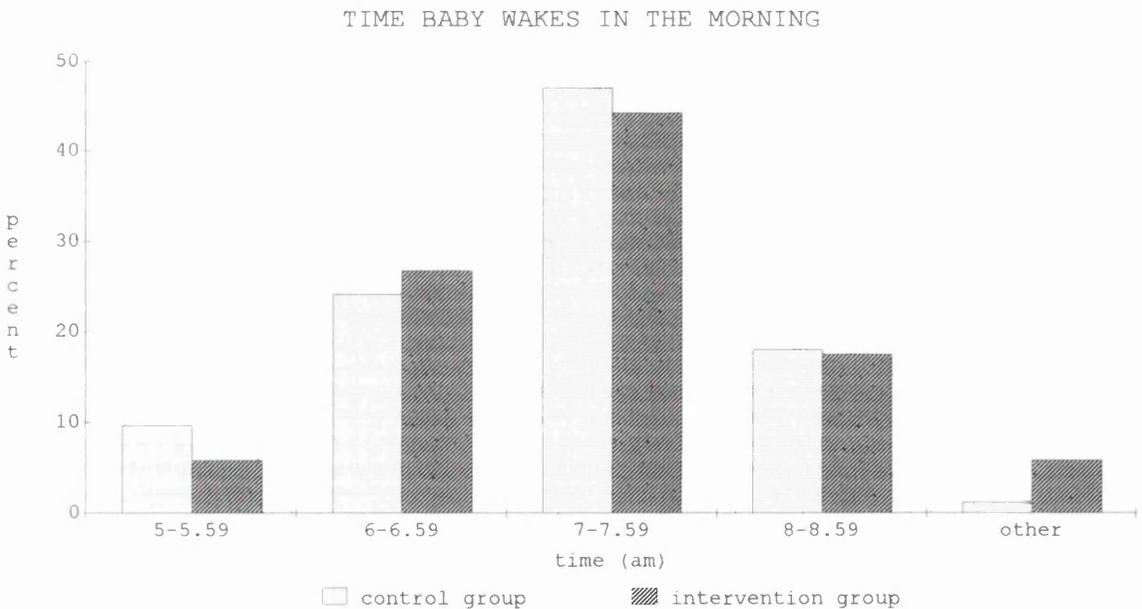
EARLY WAKING

The third main section of data was that relating to early waking.

Waking in the morning

For the purpose of the study, the morning was classified as 5am and after. The parents were asked to state when their child generally woke and cried for attention. **Figure 25** shows the times that the children woke in both groups.

Figure 25



Children who woke between 5am and 7am were considered to be 'early wakers' by the researcher, however the parents were not always unhappy if their child woke before 7am.

In total, 34% of the control group woke before 7am compared to 32% of the intervention group. The waking times in both groups were compared and were found to be similar ($\chi^2=3.5$, $df=4$, $p=0.47$).

Fifteen percent of the parents in the control group stated that they were quite happy with their child waking before 7am compared to 10% in the intervention group. Only 1% of the parents in the control group said that they were happy with their child waking between 5am and 6am, none of the parents in the intervention group found this waking time acceptable. Again the groups were compared to see if there was a statistically significant difference, there was not ($\chi^2=2.4$, $df=3$, $p=0.50$).

NAPS

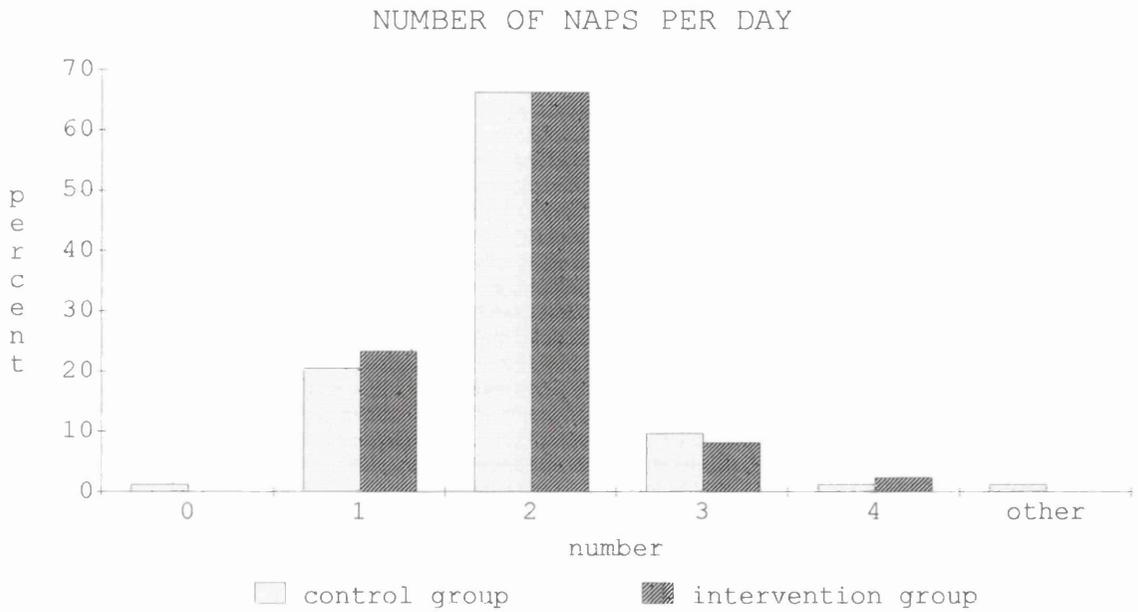
The final area that was assessed was that of naps.

Number of naps per day

The parents were asked to state, on average, how many times per day that their child took a nap, **Figure 26** shows the results.

The number of naps varied from no naps to four naps per day. The majority of children had two naps, this was 66% in both the control and intervention groups. There was no significant difference between the groups in the number of naps the children took per day ($\chi^2=2.63$, $df=4$, $p=0.62$). Initial statistical analysis demonstrated that there was 1 cell with an expected count of less than 1, children who did not have a nap were therefore grouped with those listed under 'other'.

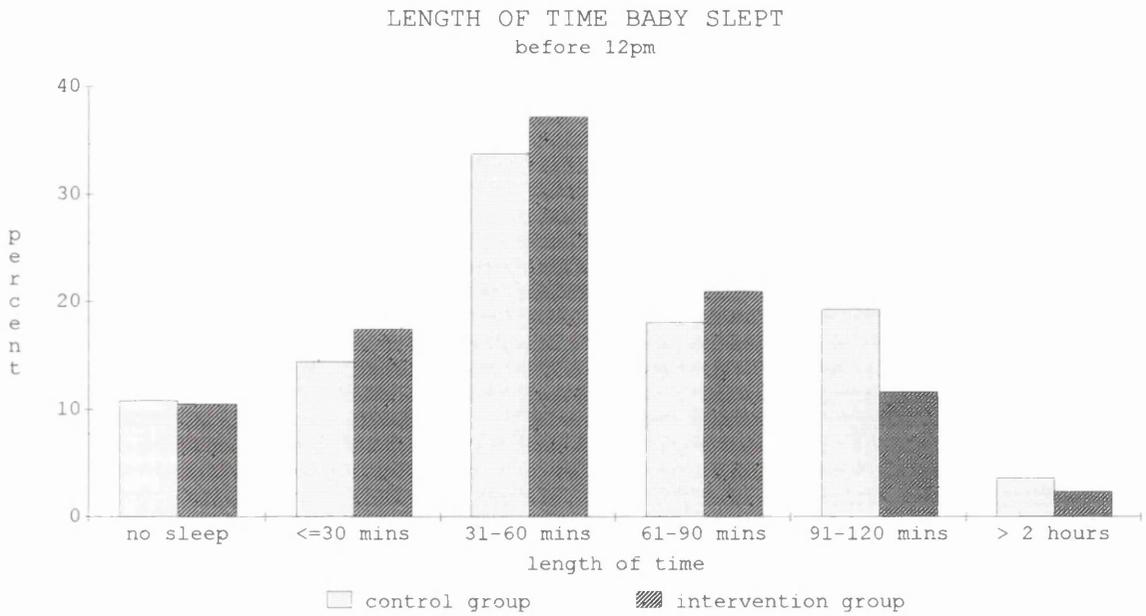
Figure 26



Length of time baby slept

The parents were asked to state, on average, how long their babies slept during the day. **Figure 27** shows the results for naps before 12pm, and **Figure 28** shows the results for naps after 12pm.

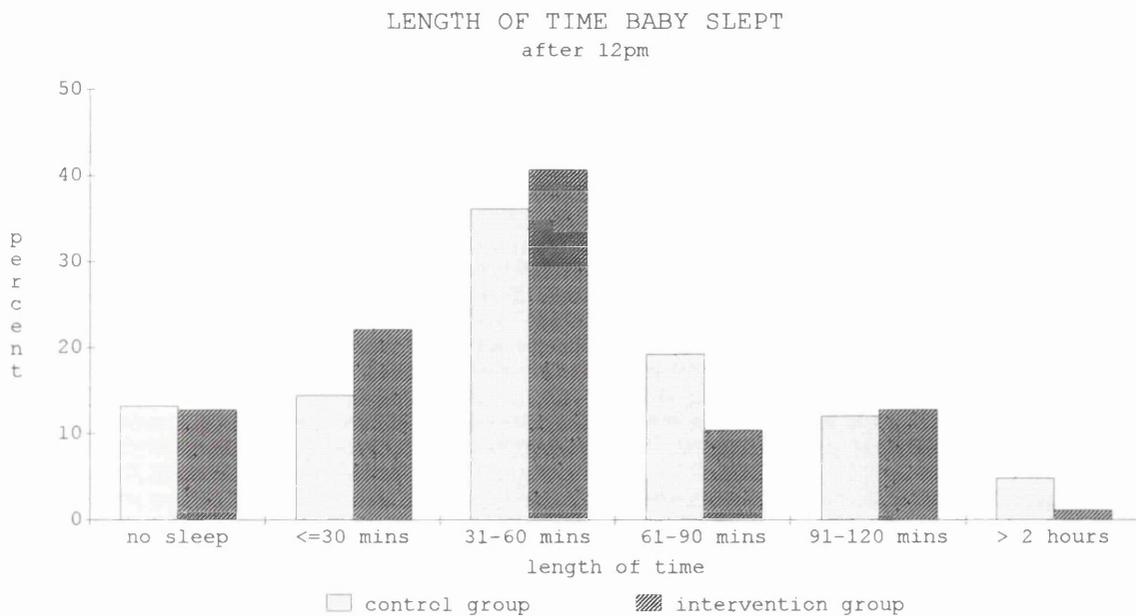
Figure 27



The most common length of time that the children slept in the morning was 31-60 minutes, although the time varied from not sleeping at all, to more than two hours. Again, there was no significant difference in the length of time the babies slept in the morning ($\chi^2=2.4$, $df=5$, $p=0.79$).

The parents were asked where their babies actually slept when they had a nap in the morning. Most of the babies slept in their cot or in their pram, and there was not a statistically significant difference between the groups ($\chi^2=5.18$, $df=4$, $p=0.27$).

Figure 28



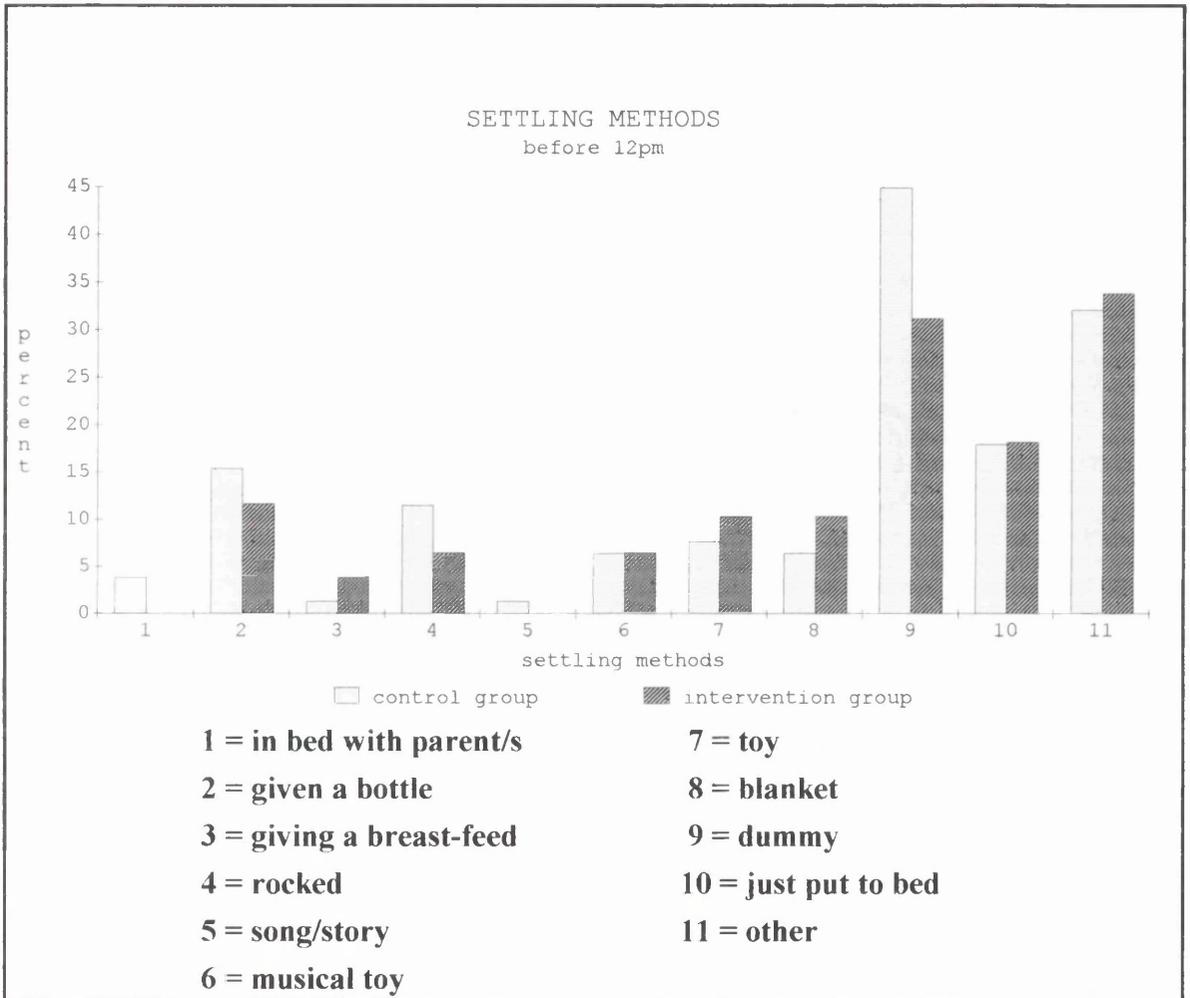
The most common length of time that the children slept in the afternoon was again, 31-60 minutes. There was not a statistically significant difference between the groups ($\chi^2=5.72$, $df=5$, $p=0.33$).

Again, most of the babies slept either in their cot or pram, the groups were not significantly different ($\chi^2=1.84$, $df=4$, $p=0.77$).

Settling methods for naps

Parents were asked how they settled their child to sleep for his/her nap. **Figure 29** shows the different methods used in the morning.

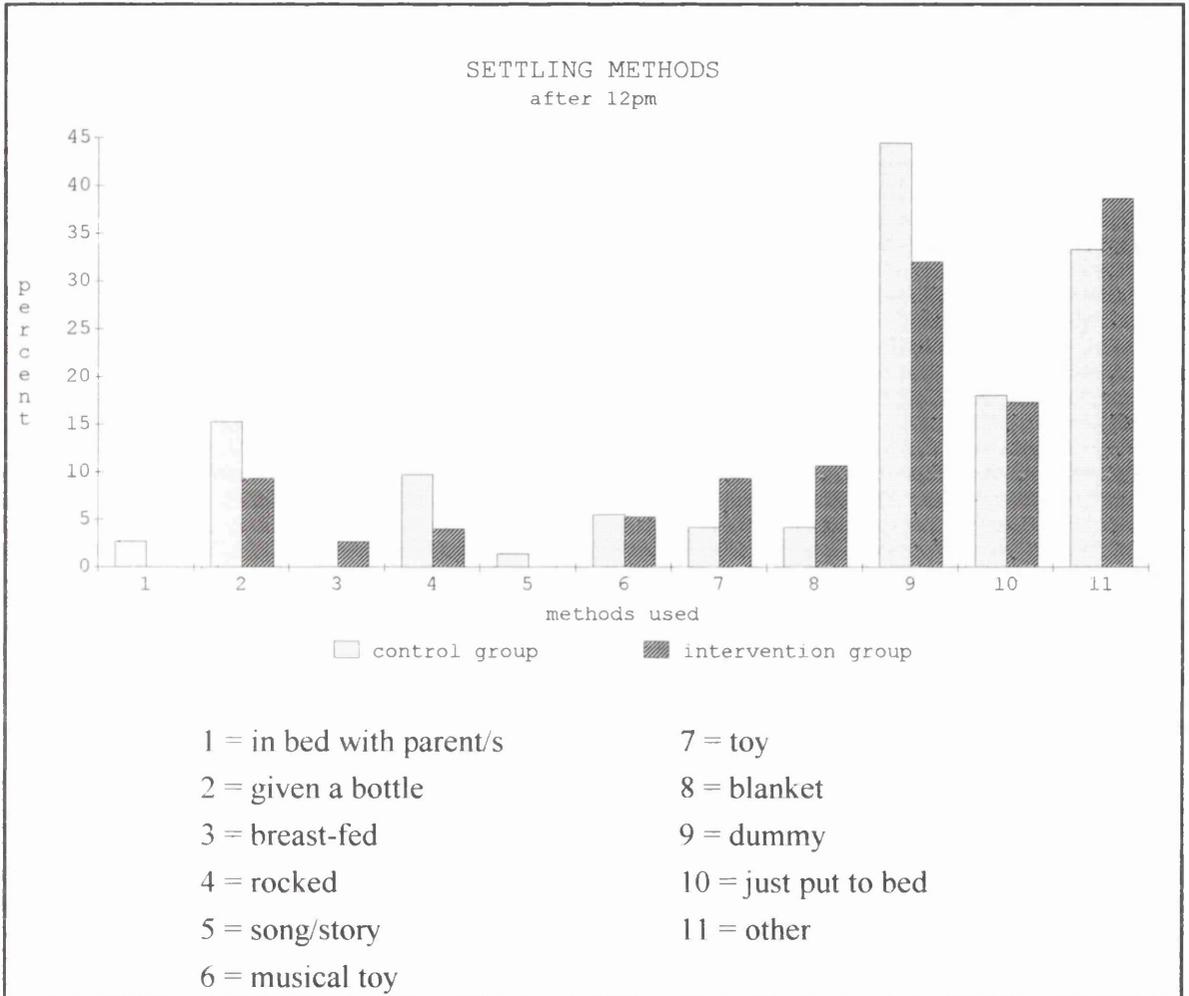
Figure 29



Parents may have employed more than one settling method and so the χ^2 statistic was calculated for each method separately. As can be seen, giving the babies a dummy was the most popular way of encouraging them to fall asleep, 45% of the control group used this method compared to 31% in the intervention group ($\chi^2=3.08$, $df=1$, $p=0.08$). There was not a statistically significant difference between the groups in any of the areas listed.

Figure 30 shows the methods of settling adopted in the afternoon. Again, there was not a statistically significant difference between the groups, (p values ranged from 0.30-0.99).

Figure 30

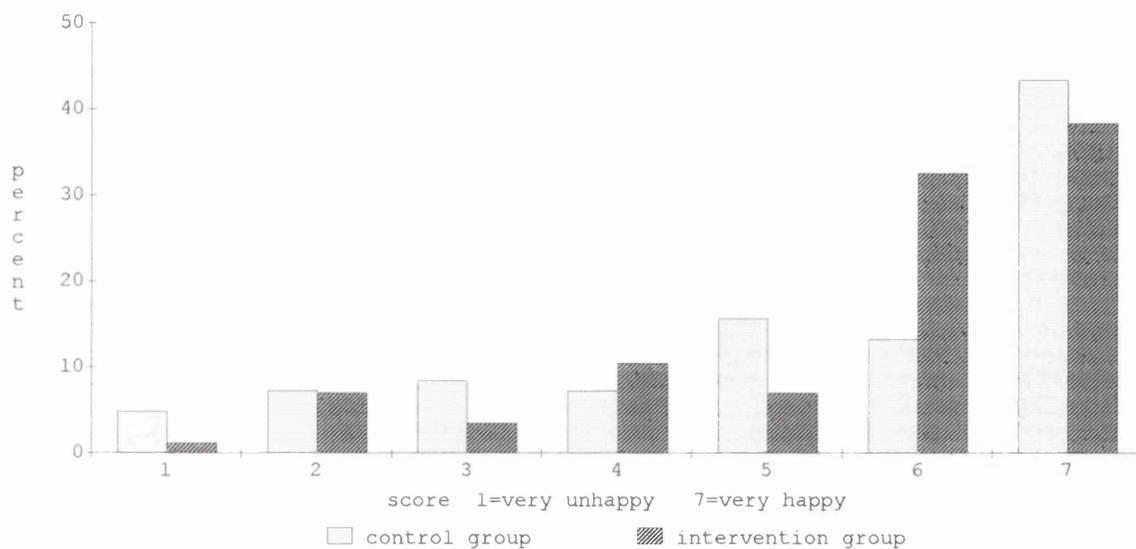


Parental Feelings Regarding the way their Child was Sleeping

Finally, parents were asked to say how they felt about the way their baby was sleeping. They were asked to indicate how they felt by showing the position that reflected their feelings on a Semantic Differential Scale. **Figure 31** shows the results, a score of 1 means that the parents were very unhappy, and a score of 7 means that they were very happy with the way their baby was sleeping.

Figure 31

PARENTAL FEELINGS
relating to baby's sleep pattern



The average score in the control group was 5.35 compared to 5.66 in the intervention group. Twenty percent of the control group had a score of 1, 2 or 3 compared to 12% in the intervention group. The majority of parents were happy, or reasonably happy with the way their baby was sleeping, 57% of the control group had a score of 6 or 7 compared to 71% in the intervention group.

The data was ordinal and so the scores were compared using the Mann Whitney U Test. There was not a significant difference between the two groups in the way the parents felt about the way their baby was sleeping ($p=0.56$, 95% CI for differences in medians:0).

6.4 PARENTAL COMMENT ON THE BOOKLET

The analysis of the effect of the intervention is not considered complete without reporting the qualitative comments of the parents on the information they received. The parents in the intervention group were asked to discuss the booklet once the data in the interview schedule had been collected. They were asked to voice their opinions freely and honestly. Additionally, they were asked to state what they felt would be the most appropriate time to receive preventive advice.

The question was an open question, and the comments were noted by the researcher. The comments were entered into a database and six broad areas emerged when the data was analysed. These areas are listed below with some illustrative examples of the comments that were made, the comments used are considered representative.

Sensible/Common-sense

"The booklet contained good common-sense advice. I referred to it a few times when I hit a spell when my baby started waking".

"I followed the advice and found that it worked well, basically it's common-sense. I wish I had followed this advice with my first child, he slept poorly until he was four years old".

Following Advice Anyway

"We were following the advice anyway, the booklet gave us the confidence to carry on".

"I was following the advice anyway. The booklet is a good idea, I have many friends and relatives whose children sleep poorly".

Good/Useful/Helpful

" The booklet contained good advice. It was useful even though I have other children".

" The booklet was good. The dummy and cuddly-toy advice was very useful".

Passed on Advice

"Our older boy slept poorly. The booklet was very helpful. I photocopied it and gave copies to other mothers at work who were having problems".

"I passed the booklet round the Mother and Toddler group, it was a God-send".

Did Not Use the Advice

"I tried the advice a few times, it didn't work".

"I was following the advice anyway, I didn't feel I had a need for the booklet".

Easy-to-Read

"The booklet was short and easy to read, just what you need when your baby is young and you have little time to read".

"The booklet was easy to read, I consulted it a few times. My health visitor thought it was very good, she photocopied it".

The Best Time to Receive Preventive Advice

The time that the parents considered was the most appropriate to receive preventive advice ranged from ante-natally to three months after the baby was born. Sixty-two percent of the parents said that they felt the best time to receive the advice would be when the baby was between six weeks and three months, 25% felt that between birth and six weeks was best, and 13% would have liked advice in the ante-natal period.

6.5 A COMPARISON OF THE SAMPLE TO THE POPULATION

Before discussing the results in the next chapter it was essential to consider whether the data was collected from a sample which was representative of the target population. As stated in Chapter Five the response rate in the study was 33-34%. This low response had potential implications for the generalisability of the results discussed above, and therefore had to be addressed. A random sample of babies were initially chosen, by doing this the researcher considered that this sample should have been representative of the target

'population'. If all of these families had agreed to take part, the researcher would have considered that she could have generalised the results to the Greater Glasgow Health Board Area. However, because they did not all agree to take part in the study consideration had to be given to the characteristics of the parents that agreed to take part compared to those that did not agree to take part. The researcher had little data on the non-respondants, but when examining the areas that they lived it appeared that there were pockets of non-response from socially deprived areas. It was considered that the families who agreed to take part could be compared to those that did not using the DEPCAT Scoring system devised by Carstairs and Morris (1991).

Using variables recognised as being indicators of disadvantage Carstairs and Morris devised a scoring system which allocates a deprivation index to each postcode area in Scotland. The deprivation index combines four variables taken from the census data, and includes overcrowding, male unemployment, low social class and lack of car ownership. **Figure 32** highlights the difference in DEPCAT scores between the families that responded and those that did not. The DEPCAT scores range from 1 to 7, with a score of 1 indicating an 'affluent' area, and a score of 7 indicating a 'deprived' area.

Figure 32



The DEPCAT scores were compared using the Mann Whitney U Test, and a highly significant difference was found between the groups ($p=0.00002$, 95% CI for differences in medians: 1 to 2). The median score for those that agreed to take part was 4 compared to a

median score of 6 for those that did not respond. It is obvious when looking at **Figure 32** that families from affluent areas were over-represented, and families from deprived areas were under-represented.

CHAPTER SEVEN - DISCUSSION OF RESULTS

7.1 INTRODUCTION

Previous studies have demonstrated that sleep problems in infants are prevalent (Galbraith, Hewitt & Pritchard 1993). It has been shown that disturbance to a child's sleep pattern often lasts for months and that persistence for a year or more is not uncommon (Richman, Stevenson & Graham 1975). In the majority of cases a sleep problem causes significant stress within the family, and parents often seek help from health professionals (Chavin & Tinson 1980). Although it has been shown that treatment can be effective, regular contact with health professionals over a number of weeks is normally required (Hewitt 1988). In recent years it has been suggested that prevention may be a better solution, and that rather than waiting until a sleep problem exists it may be possible to prevent the problem developing. Parents have welcomed preventive advice but no attempt has been made to determine whether a degree of prevention can occur (Hewitt & Galbraith 1987).

The aim of this research was to take what is considered a first step in evaluating whether sleep problems can be prevented. Adopting an experimental approach participants were randomly allocated to a control group or an intervention group. The parents in the intervention group were given preventive information and advice in the early post-natal months, and a comparison of the sleeping behaviour of the two groups was undertaken approximately six months later. The data collected was analysed to determine whether the demographic characteristics of the groups were similar and to compare the sleeping behaviour. The results of the analysis are discussed below.

7.2 SUMMARY OF THE RESULTS

The Demographic Characteristics of the Groups

Families were allocated to groups randomly and so on this basis the demographic characteristics of each group should have been similar. The collection of the demographic details served as a double-check. The data were analysed to test the null hypothesis that there was no statistically significant difference in the demographic characteristics of the control group and the intervention group.

In total 64 variables were compared between the groups. The null hypothesis was rejected in only two areas, firstly, more of the mothers in the control group complained of

'discomfort' during their pregnancy (control=7%, intervention=1%), and secondly more of the babies in the intervention group had suffered minor problems with their health listed under 'other' than in the control group (control 4%, intervention 14%).

To clarify if the researcher should be concerned about these minor differences between the groups a statistician was consulted. The researcher was advised that where a large number of variables are compared across groups of this size it is only to be expected that there would be a small number of differences. In view of the initial random allocation, and because of the small numbers that were in the categories that were different these differences were not considered problematic. It was therefore considered that it could be argued that the main difference between the groups was that one group had received the information and advice, and that the other had not.

The Sleeping Behaviour of the Two Groups

The results in this section were divided into four broad areas, settling behaviour, night waking, early waking and naps. Additionally, the parents were asked to indicate how they felt about the way their baby was sleeping.

Settling Behaviour

There was no significant difference in the place that the babies slept or the time the babies went to bed.

There was not a significant difference in the percentage that went to bed when their parents wanted them to, however, a significantly smaller percentage of the control group actually tried to get their baby to bed at the time intended.

More of the control group were asleep when put to bed, but the difference was not significant. When asked why their child was asleep a significantly greater percentage of the control group could not get their baby to fall asleep in its own bed.

The methods used to settle the children to sleep were generally not significantly different. However, less of the control group were 'just put to bed', and this difference was significant. It is also of note that a larger number of the control group were fed by bottle to encourage them to fall asleep, this was an interesting trend but the difference did not reach statistical significance.

The length of time that the babies took to fall asleep at bedtime was not significantly different.

Night Waking

In relation to night waking, on average, the babies in the control group woke more times per week and more times per night than those in the intervention group. The difference between the groups in these areas was statistically significant.

The most common methods used across the groups to get the babies back to sleep was to feed them or give them a dummy. A significantly larger number of the parents in the control group gave their baby a bottle. Additionally, there were two trends, with the control group being more likely to give their baby a dummy and also to take their baby into bed.

Early Waking

More of the babies in the control group woke between 5am and 6am compared to the intervention group, and slightly less of the control group woke between 6am and 7am. The differences in the groups was not significant.

Naps

There was no significant difference in the number of naps, length of time the babies slept and the places the babies slept. More of the control group gave their baby a bottle and/or a dummy to encourage them to sleep during the day, but the group differences were not significant.

Parental Feelings Relating to their Baby's Sleep Pattern

After the parents had discussed their baby's sleeping pattern, they were asked to indicate how they felt about the way their baby was sleeping on a 7 point Semantic Differential Scale. A score of 1 indicated that the parents were very unhappy whilst a score of 7 indicated that they were very happy. In general, the scores in the intervention group were higher, however the difference between the groups was not statistically significant.

The Null Hypothesis

The null hypothesis was that there was no significant difference in the sleeping behaviour of the control group and the intervention group. When analysing the sleeping behaviour of the groups the null hypothesis was rejected in two of the four broad areas. A significantly larger number of the control group had settling difficulties, and a significantly greater number of the control group demonstrated night waking difficulties. Additionally the intervention group were more likely to 'just put their baby to bed' at bedtime, and less of the intervention group bottle fed their baby to get it back to sleep during the night.

7.3 LIMITATIONS OF THE STUDY

Internal Validity

Consideration was given to factors other than the intervention that may have produced the improvement in the sleeping behaviour of the intervention group. Two areas were considered to pose threats to the internal validity. These are the accuracy of interviewee response and potential interviewer bias.

It could be argued that the parents in the intervention group may have been less likely to be completely honest when reporting the sleeping behaviour of their children. They had been given information and advice and so they may have felt that they should have been able to encourage their baby to sleep well. Treece and Treece (1986) state that when people are interviewed there can be a tendency to give the interviewer the response that is judged to be the one that he/she wants. The researcher had no way of assessing the accuracy of report in either of the groups.

The second potential threat to the internal validity of the results is the fact that the researcher intervened and also collected the data on the sleeping behaviour of the two groups. The interview schedule was structured and the majority of the questions were closed-ended in order to reduce interviewer bias to a minimum. It is considered that it would have been preferable for an independent researcher to have collected the data, however because of financial constraints this was not an option in the project..

External Validity

The fact that the sample had been chosen randomly from the target population should have allowed generalisation of the results. However, because the response rate was only 33-34%

attempts had to be made to compare the characteristics of those that responded to those that did not. Using the DEPCAT scores devised by Carstairs and Morriss (1991) it was demonstrated that families from 'affluent' areas were over-represented in the sample and families from 'deprived' areas were under-represented. It was considered that families from deprived areas were evenly divided between the groups, however, because of their limited response they were not represented in each group in proportions that were similar to the population. It is therefore considered that the results of this study cannot with any certainty be generalised from the sample to the target population.

7.4 DISCUSSION OF THE RESULTS

The results of this research appear to confirm that the provision of verbal and written information and advice can help parents improve the sleeping behaviour of their infants. However, there were some threats to the internal and external validity of the results and therefore they should be treated cautiously. Previous studies have attempted to define what a sleep problem is, different definitions have been used in different studies, and so it is difficult to compare the results in this study with other work. Richman (1985) defines a sleep problem as waking more than three times per week and two or more times per night, the length of time the child is awake is also included. In this study what was taken was a snap-shot of the sleeping behaviour over a period of one week, this was done because of the rigorous control that was necessary; it is recognised that this period may not be fully representative of the sleeping behaviour over a longer period. In this study the number of nights per week, the number of times per night, and the length of time the child was awake were combined to produce a Cumulative Night Waking Score. A score of 14 or more was taken as indicating a 'severe' problem in the week of data collection. Thirty-nine percent of the control group had a score of 14 or more compared to 22% in the control group. Galbraith, Hewitt & Pritchard (1993) demonstrated that approximately 42% of nine month old babies had sleep problems, and it is interesting to note that this percentage is similar to the number in the control group that were considered to have a problem in the week of data collection.

Consideration has to be given to the two broad areas where the null hypotheses were not rejected. Early waking behaviour and the behaviour relating to naps were not significantly different. The majority of the babies in the study had two naps per day and slept for 30 minutes to one hour. Naps were not considered to be a problem area, and therefore the fact that there was no significant difference between the groups was of no concern. For the purpose of the study early-waking was classified as waking before 7am. The researcher

had not given specific advice on early-waking, and it was considered that this may have been a factor. Approximately 30% of both groups woke before 7am, and although the parents were not always unhappy with this it is considered that advice in this area may have been useful. The researcher had concentrated on the areas of settling difficulties and night waking difficulties because previous research had indicated that these two areas were the areas where problems were prevalent.

Another interesting point is although the babies were sleeping better in the intervention group, when asked to indicate how they felt about the way their child was sleeping the scores in this group were not significantly higher than those in the control group. The reason for this is unclear and requires more detailed study. It may have been that a simple scale like this was not sensitive enough to pick up any differences. One of the aims of a preventive approach is to reduce the detrimental effects that a sleep problem can have on family life. It was assumed that when the children were sleeping better in the intervention group the parents were have stated that they were 'happier' with the way their baby was sleeping. It is considered that studies carried out in the future should investigate this area in more detail. From a subjective point of view it is considered that the researcher had raised the expectations of the intervention group. When indicating how they felt, many of the mothers said 'I'm quite happy, but I know he/she could be sleeping better', and therefore they marked lower down the scale.

Although the intervention appears to have been useful in reducing settling and night waking difficulties the research has not shown which element of the intervention was effective. It may have been the verbal input, it may have been the written input, or it may have been the combination of the two. Alternatively there may have been some non-specific element of the intervention that effected the parents behaviour. However the findings do suggest that a number of the intervention group were following the advice, as less of this group fed their baby to get it to sleep and less of this group used dummies or took their baby into bed to get it back to sleep.

In view of the short-term nature of this study the parental reaction was seen as an important indicator of the long-term success of the intervention. The discussion of the results is therefore not complete without considering the reaction of the parents. The majority of parents were positive about the intervention stating that they welcomed the opportunity to discuss their child's sleep pattern and that the booklet contained "helpful, common-sense advice". The booklet was considered "short and easy to read, and was just what was needed when there was limited time to read". A number of the mothers passed the booklet to family and friends who also had young babies. Some of the parents said they were following the advice anyway, however most of them felt encouraged to persevere

with what they were doing. A few of the mothers stated that they did not need the booklet because their child was sleeping well, but they believed it would be useful for other mothers. It is recognised that when asked to comment in these circumstances people find it difficult to make negative comments (Dixon 1992). However, it was considered that the majority of parents were not just positive but they were genuinely enthusiastic about the booklet.

Consideration must be given to parents who received the advice but whose children were not sleeping well. The parents were asked to state why they felt their child was sleeping poorly, and what their opinion of the advice was. Surprisingly, most of these parents made positive comments about the booklet. Even though they had not managed to employ the advice they believed that they knew more about sleep and settling behaviour than they had before. Two of the mothers stated that they did not wish to encourage their baby to sleep by itself, and they were happy for their baby to sleep with them at night. Other mothers stated that the advice was good but they had not managed to employ it for a variety of reasons. Some of these mothers said they found it difficult to follow the advice because they had other children. In these circumstances if the baby woke at night, they would feed the baby or take it into bed quickly to avoid disturbing the other children. A few mothers said they had tried to follow the advice but it did not work, it was not clear how long they had persevered.

This study evaluated the general efficacy of a preventive approach, the advice concentrated on 'caregiving' factors and did not attempt to alter other potential causal factors. Clearly if a preventive approach is to be employed by health professionals consideration should be given to other possible factors. As stated in the literature review, the paths of cause and effect are difficult to determine and so it would seem simplistic to believe that all sleep problems can be prevented by an intervention such as this. Factors such as poverty, overcrowding and maternal mental health problems are just some of those that have been associated with the development of sleep problems (Richman 1981). It would therefore seem that a percentage of families may also require assistance in overcoming problems such as these. Health visitors are well placed to give preventive advice whilst taking into account other potential causal factors.

CHAPTER EIGHT - CONCLUSION AND RECOMMENDATIONS

This research indicates that in the short-term a preventive approach can produce a significant improvement in child sleeping behaviour. The research also confirms what previous research has demonstrated (Hewitt & Galbraith 1987; Hewitt 1987), that parents welcome preventive advice. The positive response of parents to the advice strongly indicates that this approach may be efficacious in the long-term. It is recommended therefore that further study is undertaken to evaluate the intervention described in the longer term. It may be that there is what Green (1977) describes as 'decay of impact' with an intervention producing an effect that does not last in the long-term. In order to establish the cost-effectiveness of this approach, the minimal intervention required to produce long-term benefit should be examined.

It is recommended that further evaluative studies be carried out in which health visitors give the advice to families. The aim was to design a health education package that could easily be used by health visitors. It is considered that the information and advice delivered in this project can easily be incorporated into the everyday work of health visitors. In this study there was a focus on the advice at a special visit, if health visitors were to give the advice it anticipated that the advice will be part of a visit where many other issues are being discussed. It may therefore be argued that the impact of the advice would be less. Alternatively, the effect of the advice may be greater because health visitors will have more contacts with the parents and will therefore be able to consolidate advice originally given in the early weeks.

The parents in this study indicated that they would have liked the information a little earlier, and so it is recommended that the advice be given between 6 weeks and 3 months, if possible.

APPENDIX 1

HEALTH EDUCATION MATERIAL

BBC Education. (1992). Sleep, London, BBC Education.

Cry-sis. (no date of publication). Sleep Problems in Babies, London, Cry-sis.

Cry-sis. (no date of publication). It Worked for Me, London, Cry-sis.

Pontefract Health Authority. (no date of publication). Encouraging Good Sleeping Habits in Your Baby and Toddler, Pontefract, Pontefract Health Authority.

How To Help Your Baby Sleep Well



<i>Contents</i>	page
Introduction	2
Sleep	3
Normal Sleep Patterns	4-5
How Do Sleep Problems Start ?	5-9
How To Help Your Baby Sleep Well	10-13
Summary	14

When talking about your child in the booklet, the word 'he' has been used. Please read 'she' if your child is a girl.

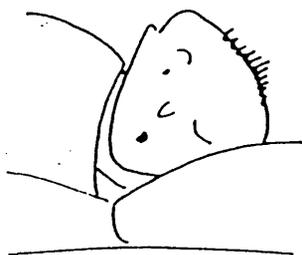
Introduction

Sleep problems are very common in young children. Children often wake many times during the night or won't settle to sleep at bedtime. This means there are a lot of tired parents around.

I have written this leaflet to help you to help your baby sleep well as he gets older. It is much easier to prevent a sleep problem than to try to solve it.

I hope you will find the information helpful. You as a parent will decide what is right for you and your baby.

Sleep



First of all it is important that you know something about sleep.

Light and Deep Sleep.

During the night we all have some spells of light sleep and some spells of deep sleep. You will know that it is difficult to wake your baby when he is sleeping deeply but that he will wake easily when he is sleeping lightly. A young baby may have as many as 8 spells of light sleep during the night. He will often wake up during a period of light sleep.

It seems that for many children who don't sleep well the problem is not that they wake up but that they can't slip back to sleep without the help of a parent. Waking during the night is normal. You have to teach your child, as he gets older, to fall asleep again without your help.

We, as adults, often wake during the night when we are in a period of light sleep. If everything seems okay we drift back to sleep and usually do not remember these waking spells in the morning.

Why do we Need to Sleep?

Sleep is important for good health. It rests the body and mind. We all know that without a good night's sleep we can be tired and short tempered. In children, growth takes place and resistance to infection is built up during sleep.

Normal Sleep Patterns

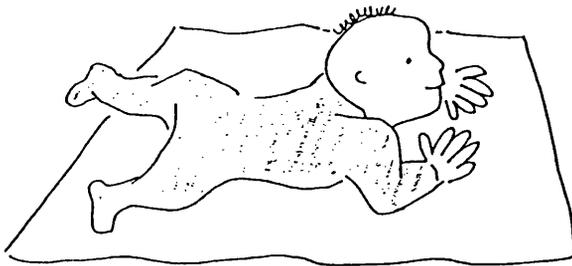
There is a big difference in the amount of sleep that children need. Just as with adults, the amount of sleep taken varies. Sleep patterns change with the age of the child.

The Newborn Baby

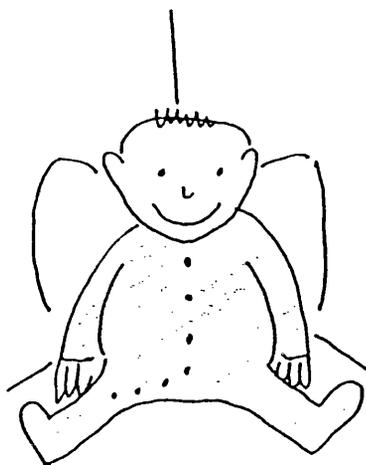
You will probably remember the first 6-8 weeks after your baby was born as being unsettled. During this time sleeping and eating patterns are often not regular. A newborn baby may sleep about 16 out of 24 hours. This sleep occurs in short spells of only 2-4 hours at a time. In the first few weeks roughly the same amount of sleep is taken during the day as at night.

3-4 Months

Between the ages of 3-4 months a routine should be starting. A baby of this age sleeps about 15 out of 24 hours. Your baby may sleep about 8-10 hours at night. This is what we tend to call 'settled', that is, he sleeps from a late night feed to an early morning feed.



6 Months



By the age of 6 months sleep has often increased to about 12 hours at night. Babies settle in different ways. Your baby may simply sleep through a feed or he may gradually make his feeding time later and later. Babies sometimes continue to wake for a feed at night. From 6 months on this may be turning into a habit rather than something that is needed. **If your baby is feeding well during the day there is no need to feed him after the age of 6 months during the night.** Most babies will have two naps, one in the morning and one in the afternoon. The naps usually last about one hour.

1 Year

By the time your baby is 1 year old, 14 hours of sleep in 24 hours is typical. He will probably give up one of his naps between his first and second birthday.

The ability to sleep through the night comes in time, and in many cases without you doing much about it. However, there are ways in which you can help your baby stay asleep and to settle himself back to sleep once he has woken.

I'm sure like most parents you would like a full night's sleep as soon as possible. Try to start out on the right foot. Some of the ways sleep problems can start are talked about in the next section.

How do Sleep Problems Start

Birth and the Early Weeks

Wakeful children have sometimes been distressed at the time of birth, or just after birth. The mother may have had a caesarean section or high blood pressure.

Of course, not every baby who has had these experiences sleeps badly and many poor sleepers had a normal birth.

The Premature Baby

Some premature babies sleep a lot and others are restless. Premature babies have to make up for all the weeks they should have been in the womb. This means that they tend to take longer to sleep through the night.

Temperament

There are big differences in how much babies cry and how easy they are to calm down. Part of the difference may be explained by what we call the baby's temperament. With some babies you may have to work harder to encourage good sleeping habits. Some babies are more upset than others by noises and light or being wet or hungry.



Medical Causes

Your baby's sleep may be upset at night because of medical problems. Any illness, especially with fever or pain can upset sleep patterns. After an illness some children slip back easily into smooth sleep patterns. Other children may carry on being wakeful.

In most cases sleep problems do not have a medical cause. If you are unsure consult your GP or health visitor.

Colic



Most cases of colic go by 3 months of age. However, colicky babies may develop sleep problems. If your child was colicky you may have spent a lot of time walking, rocking and holding him. Once the colic has gone, you should not have to use these methods to settle him to sleep but he may still want you to.

It can be hard to tell when the colic has gone. If your baby cries when you put him down and stops quickly when you pick him up the colic has probably gone. If your baby goes back to sleep quickly after being rocked or fed it is unlikely that colic is still the cause of the trouble.

You and Your Baby

By the age of 3-4 months most babies are, or could be, sleeping through most of the night. If your baby has not settled by 5-6 months you should take a close look at his bedtime routine. If your baby is always fed or rocked to sleep he may have difficulty going back to sleep after a normal night-time waking. You will remember that babies often wake during a period of light sleep, this is normal. However, if your baby depends on you to get him back to sleep he will cry until you get up to rock or feed him back to sleep.

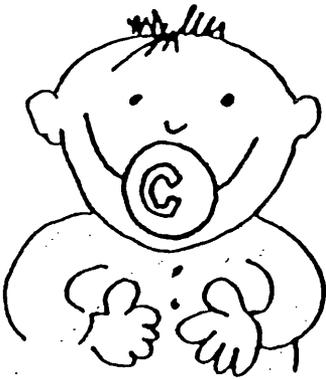
All children learn to connect certain things with falling asleep. Being in the same bedroom, lying in a certain cot or holding a special toy or blanket can all be very important to your baby. The conditions are still the same when he wakes up at night and because they are, he feels secure and returns to sleep.



Feeding During the Night

Night-time feeding can be the cause of a major sleep disturbance. As stated before, sometime between 3 months and 6 months, your baby should stop needing to be fed overnight. If your child wakes repeatedly after 6 months and has to be fed to go back to sleep then he is developing a sleep problem and the feedings are the cause.

If your child gets used to being fed during the night his body will begin to think of the night-time sleep periods only as naps between feeds.



A Word About Dummies

Dummies help some children to settle themselves to sleep. You may use one for your baby. The problem is the dummy often falls out during sleep and your child may wake and cry out to have it replaced.

How To Help Your Baby Sleep Well

As your baby gets older we have seen that there should be a change in his pattern of sleep. This change often starts in the first few weeks and by about four months your baby may sleep twice as much at night as during the day.

This section discusses some important things that will help your baby to sleep well. If your child falls asleep easily in his cot and does not usually wake up, your routine is working. However, your baby may be one that has not 'settled' and you may have to work a little harder than other parents to form good sleeping habits.

Sleep Problems Are Common

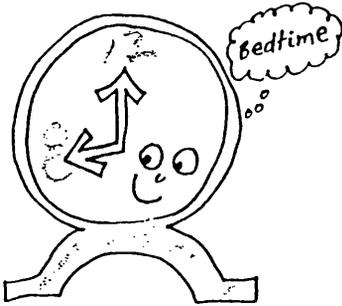
Many children develop sleep problems as they get older. These problems sometimes last for months, or even years. Armed with the information in this booklet, you can prevent problems starting, or at least help to solve a wakeful period as soon as possible.

Remember that babies, like adults, need different amounts of sleep and you must take this into account.



The Importance of Routine

After the first 3-4 months you should start a routine of settling your baby which he can get used to. It is important to make a clear difference between day and night and between times for sleeping and waking. When you are at home always put your baby to sleep in the same place.



If you feed or rock your child to sleep you may eventually have to do this before he will ever fall asleep. Don't let him fall asleep in your arms or on the settee, this is storing up trouble for later on as he gets older.

It is best after the first few months to put your baby in his cot while he is tired but still awake. He should get used to falling asleep without your help. Give him a chance to settle. If he stirs or cries a little don't rush in because you may wake him just as he is dozing off.

Snuffles and Snores

When falling asleep, babies often make little jerky movements, you may have noticed this. These movements are a normal part of drifting into sleep. Some babies are more active than others; your baby may move around a lot in his cot and snore or snuffle. You have to get used to this or you will be running in and out to check your baby all night.

If it is possible it is a good idea to share the settling so that your baby doesn't depend on just one person.

The Right Conditions For Sleep.

As your baby gets older, the routines at bedtime continue to be important. If bedtime is a pleasant time your child will look forward to this time of the day. A routine for a young baby may include a bath, changing into night clothes, a feed, a cuddle and bed. Older children may enjoy some quiet play or a story or song.

As your child gets older it is important to set a time when he is usually put to bed. **Bedtime routines can be different and you will choose a routine that suits your family. It is important to follow this routine as much as you can.**

You need to settle your child to sleep under the conditions that will stay the same all night. You don't want your baby to wake up upset or angry because the place he went to sleep has changed. He will also be upset if he wakes, and mum who nursed him to sleep is nowhere to be seen. Once your baby is asleep he will probably wake from a period of light sleep a few times during the night. You will remember that this was discussed before. We all wake a few times during the night, a young baby may wake as many as 8 times overnight. You have to teach your baby to get himself back to sleep. If he cries out it is important to go to him quickly. However, try not to lift him out of his cot. Don't rock or feed him back to sleep or he will rely on you to get him back to sleep every time he wakes up.



Separation From You

To fall asleep means to be separated from those you love and trust. This is not an easy thing for your baby to learn. Babies between 8-10 months of age often get very upset when separated from their parents. This is a normal part of their development. **Sleep problems often start at this age.** Attend to his cries quickly, however attention should be low-key. Let him know that you are there but don't lift him out of his cot.

Comforters

Many children like to fall asleep holding a special toy or blanket. This can be very useful and helps your child accept being separated from you at night. These objects can be a great comfort when he is alone. If your child does not have a special toy or blanket you can encourage him to accept one. **Reality is that you cannot always be there.**



Daytime Naps

As your baby gets older you can encourage certain times for daytime naps. A baby over 6 months old will usually have two naps. Your baby may have a nap in the middle of the morning and in the middle of the afternoon. **It is important, when possible, to put him in the same place he sleeps at night.** Again, don't rock or feed him to sleep. Put him down when he is drowsy but not asleep. The same applies at night-time, he should learn to fall asleep without your help.

A good bedtime routine is very important and will help your child to fall asleep easily and sleep well all night.

Summary

- Sleep problems are very common in children.
- Your baby has spells of light sleep and deep sleep during the night. During a spell of light sleep he will often wake up. You have to teach him, as he gets older to fall asleep again without crying for your help.
- A baby of 6 months and older should be able to sleep through the night. Many babies sleep for 10-12 hours overnight.
- Some babies seem to be irritable and sleep poorly from birth. A premature baby may take longer to settle. A baby who has suffered from colic may be more likely to develop sleep problems.
- After the first few months it is best to encourage a bedtime routine. You should teach you baby to settle without your help. Your baby will quickly learn the difference between day and night.
- If you rock your baby to sleep or feed him until he drops off he will need your help every time. This may mean you will have to get up many times during the night.
- The use of a favourite toy or blanket can help your baby to feel secure at night and settle if he wakes.

This booklet has been produced by the Department of Nursing Studies in The University of Glasgow. 1993.

APPENDIX 3

PILOT STUDY

COMMENTS ON THE HEALTH EDUCATION BOOKLET

Graphics

front page _____
page 3 _____
page 4 _____
page 5 _____
page 6 _____
page 7 _____
page 8 _____
page 9 _____
page 10 _____
page 11 _____
page 12 _____
page 13 _____

text

Title _____
Sleep _____

Normal Sleep Patterns

How Do Sleep Problems Start?

How to Help Your Baby Sleep Well

Overall impression:

PILOT STUDY INTERVIEW SCHEDULE

SECTION A

1. Over the last week which room has your baby slept in for most of the night?

- same bedroom as parents []
- shared bedroom with brother/sister []
- shared bedroom with other person []
- alone in bedroom []
- other (specify) _____ []

2. At the beginning of the night was this the room that you planned your baby would sleep in?

- yes []
- no []
- no preference []

3. Over the last week where has your baby actually slept for all or most of the night?

- cot []
- shared bed with parent []
- shared bed with brother or sister []
- shared bed with other person []
- other (specify) _____ []

4. Over the past week what time did your baby go to bed most nights?

- | | |
|-----------------------|-----|
| 7-7.59pm | [] |
| 8-8.59pm | [] |
| 9-9.59pm | [] |
| 10-10.59pm | [] |
| 11-11.59pm | [] |
| 12-12.59am | [] |
| no fixed time | [] |
| other (specify) _____ | [] |

5. What time did you actually intend that he/she would go to bed most nights?

- | | |
|---------------|-----|
| 7-7.59pm | [] |
| 8-8.59pm | [] |
| 9-9.59pm | [] |
| 10-10.59pm | [] |
| 11-11.59pm | [] |
| 12-12.59pm | [] |
| no preference | [] |
| other | [] |

6. If these times are different did you try to put him/her to bed at the time you intended?

no difference []

yes []

no []

other []

7. Does your baby usually fall asleep before you actually put him/her to bed?

yes []

no []

8. How long does it normally take for your child to fall asleep in his own bed at night?

0-15 mins. []

16-30 mins. []

31-45 mins. []

46-60 mins. []

1-2 hours []

more than 2 hours []

usually falls asleep before put in bed []

sleeps with other person []

9. Do you normally stay with your child until
he/she falls asleep?

yes []

no []

other []

10. How many nights in the past week has your
baby woken and cried for attention between
10pm-7am?

0 []

1 []

2 []

3 []

4 []

5 []

6 []

7 []

11. How many times did your child normally wake
per night?

0 []

1 []

2 []

3 []

4 []

5 or more []

12. If your child did wake, how long did it normally taken for him/her to get back to sleep again?

- has not woken []
- 0-15 mins. []
- 16-30 mins. []
- 31-45 mins. []
- 46-60 mins. []
- 1-2 hours []
- more than 2 hours []
- variable (specify)_____ []

13. What methods did you use to get your baby back to sleep after he/she woke up?

- in bed with parents []
- fed (bottle) []
- fed (breast []
- rocked []
- song/story []
- musical toy []
- toy []
- blanket []
- dummy []
- baby left alone []
- other (specify) []

14. What time do you classify as the end of your baby's night-time sleep?

- 5-5.59am []
- 6-6.59am []
- 7-7.59am []
- 8-8.59am []
- other (specify) []

15. What time would you like your baby's night-time sleep to end?

- 5-5.59am []
- 6-6.59am []
- 7-7.59am []
- 8-8.59am []
- other (specify) []

16. On average, how many times per day does your baby take a nap?

- 0 []
- 1 []
- 2 []
- 3 []
- other (specify) []

17. How long does he/she normally sleep when
he takes a nap?

doesn't normally sleep	[]
0-30mins.	[]
31-60mins.	[]
61-90mins.	[]
91-120mins.	[]
more than 2 hours	[]

18. Where does your baby normally have his/her
day-time nap?

doesn't normally have a nap	[]
	am pm
cot	[] []
pram	[] []
other (specify) _____	[] []

19. How do you get your child to sleep for his/her day-time nap?

- fed (bottle) []
- fed (breast) []
- rocked []
- song/story []
- musical toy []
- toy []
- blanket []
- dummy []
- just put to bed []
- in bed with parent []
- other (specify) []

20. To what extent are you happy with your baby's sleep pattern?

very happy I I I I I I I very unhappy

SECTION B

21. Respondant Code [] [] []

22. Group Code T [] C []

23. Sex of child M [] F []

24. Mother's age

<=14 []

15-19 []

20-24 []

25-29 []

30-34 []

35-39 []

40 + []

25. How many other children do you have?

0 []

1 []

2 []

3 []

4+ []

other (specify) _____ []

26. Members of household (state number) including the baby.

under 5 years of age []
5-16 years []
16 years + []

27. Size of accommodation.

1 bedroom []
2 bedrooms []
3 bedrooms []
4 bedrooms []
5 bedrooms []
other (specify) []

28. What is the occupation of the head of the household? _____

29. What type of delivery did you have?

normal []
forceps []
suction []
section []
don't know []

30. Was your baby well when he/she was born?

Please give details.

31. Has your baby had any problems with her/his health since birth? Please give details.

32. Did you breast feed your baby at all?

did not breast-feed

breast-fed for < 6 weeks

6 weeks < 3 months

3 months < 6 months

6 months < 9 months

still breast feeding

PROBLEMS, COMMENTS, CHANGES ETC.TO INTERVIEW SCHEDULE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

13.

14.

15.

16.

17.

18.

19.

20.

21.

22.

23.

24.

25.

26.

27.

28.

29.

30.

31.

32.

TIME TAKEN TO COMPLETE, MILEAGE ETC.

Time taken to complete _____

General response to questionnaire, non verbal cues etc.

Mileage _____

APPENDIX 5

29th October 1993

Dear

I am a nurse working at Glasgow University. I am carrying out a study which will be looking at babies' sleep patterns. I am contacting the mothers of babies who were born in Glasgow in March 1993 and September 1993.

I will be very grateful if you will take part in the study. If you agree to take part I will visit you at home within the next few weeks. The visit will last approximately one hour. Please sign the form on the next page and return it to me before 15th November. I have enclosed an envelope with my address on it. I will contact you again to let you know when I will visit.

Any details discussed with you when I visit will be confidential.

Thank you for your help.

Yours sincerely,

Susan Kerr

PLEASE RETURN THIS FORM

from:

I would like to take part in the study. signature _____

Please tick what will be the best time for me to visit.

morning

afternoon

weekday

weekend

Please add your telephone number if you have one. Tel. _____

DISCUSSION - PILOT STUDY

Background Information

Pregnancy, delivery.

Baby's health at birth and since.

Feeding.

Do you have any other children?

Did they sleep well?

Sleep Pattern

Where baby sleeps.

How long does your baby normally sleep at night?

Bedtime?

Do you have a set time when your baby goes to bed?

Do you have a set routine that you carry out at bedtime?

How do you get your baby to sleep at bedtime?

Do you put your baby to bed when he/she is still awake, or do you get him/her to sleep first?

How many times does your baby normally sleep during the day?

When your baby sleeps during the day, how long does he/she normally sleep for?

Which room does your baby sleep in during the day?

How do you get your baby to sleep during the day?

Are you happy with the way your baby is sleeping at present?

APPENDIX 7

29th January 1994

Dear _____ ,

I am a research nurse working at Glasgow University. I am carrying out a study which will look at the sleep patterns of babies in the first year of their life.

I have contacted you along with most of the mothers of babies born in December 1993 to ask if you will take part in the study. If you agree to take part I will visit you at home either **once** or **twice** over the next 9 months. The visits are very informal and will last between **30 minutes** and **1 hour**. Any details discussed will be confidential.

If you would like to help with the study I will be very grateful. Please sign the form on the next page and return it to me in the enclosed envelope by the **14th of February**.

I will contact you again to let you know when I will visit.

Thank you for your help.

Yours sincerely,

Susan Kerr

PLEASE RETURN THIS FORM

from: _____

I would like to help with the study. signature _____

Please print your full name. _____

Please tick the best time for me to visit.

morning afternoon weekday weekend

Please add your telephone number if you have one. Tel. _____

If you can answer the questions below, the information will be helpful.

1. Was your baby well when he or she was born? _____

If your baby was unwell please give some details. _____

2. Has your baby been well since he or she was born? _____

If your baby has been unwell please give details. _____

APPENDIX 8

INTRODUCTORY PAGE

1. I'd like to start by telling you a bit more about the study.
2. As you know, we are looking at the sleep patterns of babies in the first year of their lives.
3. We know that many babies develop sleep problems as they get older. Previous studies have shown that more than 4 out of 10 babies are difficult at bedtime and wake during the night. Sleep problems like this can last for months or even for years.
4. We have produced a booklet in the Department of Nursing Studies which gives you some general information about sleep and discusses some ways in which you can help your baby to sleep well as he gets older.
5. What I'd like to do today is to ask you some questions about the way your baby is sleeping at present.
6. I would then like to leave a copy of our booklet with you and return when your baby is 8-10 months old. When I return I would like to know how helpful you found the information in the booklet and to ask you some questions about the way your baby is sleeping at that point.

VERBAL ADVICE

1. From previous studies we know that 3 factors are very important when you are trying to encourage your baby to sleep well:-

(a) Your Bedtime Routine

(b) The way you settle your baby to sleep at bedtime

and

(c) How you react if your baby won't go to sleep at bedtime or wakes during the night.

2. I'll talk a little bit about these three points, they are covered in more depth in the booklet.

3. Bedtime Routine

From about this age it is a good idea to set a time when your baby goes to bed most nights. You should have a bedtime routine that is the same every night so your baby will start to learn that he is going to bed for the night and not just going down for a nap. He may have a bath, a feed, a cuddle and then bed for example. As he gets older he may like a song or a story before bed.

This sounds simple but it is very important and really helps your baby feel secure and sleep well.

4. The way you settle your baby to sleep.

It is important after the first few months to teach your baby to settle himself to sleep at bedtime. You should put him to bed when he is drowsy but still awake. If you do this he gets used to getting himself to sleep and doesn't rely on you.

If you always rock your child to sleep or feed him until he falls asleep and then put him to bed if he wakes during the night he won't be able to fall back to sleep without your help.

All babies wake during the night from a period of light sleep. Good sleepers are those that just fall asleep again, their parents do not usually know that they have woken. Poor sleepers wake up but can't fall back to sleep without a parent rocking or feeding them.

If your baby falls asleep in your arms or on the settee, when he wakes up you can understand that he will be upset if the place he went to sleep has changed or because you are not there. However if your baby is used to falling asleep on his own in his own bed when he wakes everything should seem OK and so he should hopefully return to sleep again.

5. How you react if your baby doesn't want to go to bed or wakes during the night.

Babies who are older than 8 months can start to keep themselves awake even though they are tired. This can be a difficult age with your baby often getting very upset at bedtime because he doesn't want to be separated from you.

If when your baby is this age and you have problems getting him to sleep you must take a close look at the way you react when he doesn't want to go to sleep.

Take a step back and take a look at the way you are reacting from your baby's point of view.

Which of these reactions do you think will encourage your baby to want to stay up at bedtime or during the night

(a) I cry - I get taken back into the living room - mum plays with me - I get a bottle or breast-feed

or

(b) I cry - mum pops in to see everything is OK - I get tucked in again and mum leaves.

The booklet discusses these points in more detail and gives you some other advice on how to encourage your baby to sleep well.

As I stated earlier I would like to leave the booklet with you and come back when your baby is between 8 and 10 months old to find out how useful you found the advice.

PROMPT QUESTIONS - MAIN STUDY

Background Information

Pregnancy, delivery.

Baby's health at birth and since.

Feeding.

Do you have any other children?

Did they sleep well?

Sleep Pattern

Where baby sleeps.

How long does your baby normally sleep at night?

Bedtime?

Do you have a set time when your baby goes to bed?

Do you have a set routine that you carry out at bedtime?

How do you get your baby to sleep at bedtime?

Do you put your baby to bed when he/she is still awake, or do you get him/her to sleep first?

How many times does your baby normally sleep during the day?

When your baby sleeps during the day, how long does he/she normally sleep for?

Which room does your baby sleep in during the day?

How do you get your baby to sleep during the day?

Are you happy with the way your baby is sleeping at present?

How to Help Your Baby Sleep Well

Susan Kerr & Sarah Jowett

Department of Nursing Studies
University of Glasgow

How to Help Your Baby Sleep Well

<i>Contents</i>	<i>page</i>
Introduction	2
Sleep	3
Normal Sleep Patterns	4-5
How Do Sleep Problems Start ?	6-9
How To Help Your Baby Sleep Well	10-15
Summary	16

When talking about your child in the booklet, the word 'he' has been used. Please read 'she' if your child is a girl.

Introduction

Sleep problems are very common in young children. Children often wake many times during the night or won't settle to sleep at bedtime. This means there are a lot of tired parents around.

This booklet has been written to help you to help your baby sleep well as he gets older. It is much easier to prevent a sleep problem than to try to solve it.

We hope that you will find the information helpful. **You as a parent will decide what is right for you and your baby.**

Sleep



First of all it is important that you know something about sleep.

Light and Deep Sleep

During the night we all have some spells of light sleep and some spells of deep sleep. You will know that it is difficult to wake your baby when he is sleeping deeply, but that he will wake easily when he is sleeping lightly. A young baby may have as many as 8 spells of light sleep during the night. He will often wake up during a period of light sleep.

It seems that for many children who don't sleep well the problem is not that they wake up but that they can't slip back to sleep without the help of a parent. **Waking during the night is normal. You have to teach your child, as he gets older, to fall asleep again without your help.**

We as adults, often wake during the night from a period of light sleep. If everything seems okay we drift back to sleep and usually do not remember these waking spells in the morning.

Why do we Need to Sleep?

Sleep is important for good health, it rests the body and mind. We all know that without a good night's sleep we can be tired and short tempered. In children, growth takes place and resistance to infection is built up during sleep.

Normal Sleep Patterns

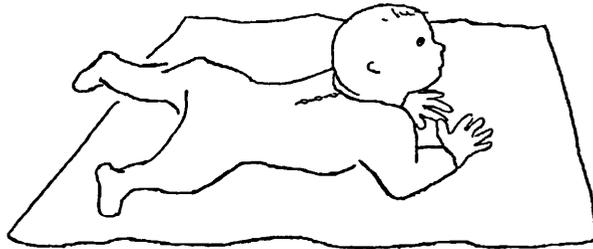
There is a big difference in the amount of sleep that children need. Just as with adults, the amount of sleep taken varies. Sleep patterns change with the age of the child.

The Newborn Baby

You will probably remember the first 6-8 weeks after your baby was born as being unsettled. During this time sleeping and eating patterns are often not regular. A newborn baby may sleep about 16 out of 24 hours. This sleep occurs in short spells of only 2-4 hours at a time. In the first few weeks roughly the same amount of sleep is taken during the day as at night.

3-4 Months

Between the ages of 3-4 months a routine should be starting. A baby of this age sleeps about 15 out of 24 hours. Your baby may sleep about 8-10 hours at night.



6 Months



By the age of 6 months sleep has often increased to about 12 hours at night. Babies settle in different ways. Your baby may simply sleep through a feed or he may gradually make his feeding time later and later. Babies sometimes continue to wake for a feed at night. From 6 months on this may be turning into a habit rather than something that is needed. If your baby is feeding well during the day there is no need to feed him after the age of 6 months during the night. Most babies will have two naps, one in the morning and one in the afternoon. The naps usually last about one hour.

1 Year

By the time your baby is one year old, 14 hours of sleep in 24 hours is typical. He will probably give up one of his naps between his first and second birthday.

The ability to sleep through the night comes in time, and in many cases without you doing much about it. However, there are ways in which you can help your baby stay asleep and to settle himself back to sleep once he has woken.

I'm sure like most parents you would like a full night's sleep as soon as possible. Some of the ways sleep problems can start are talked in the next section.

How do Sleep Problems Start ?

Pregnancy and Birth

Wakeful children have sometimes been distressed at the time of birth, or just after birth. Their mother may have had high blood pressure or an emergency caesarean section.

Of course, not every baby who has had these experiences sleeps badly and many poor sleepers had a normal birth.

Colic

Colic is the word used to describe a problem that some babies have in the early months. Babies that have colic appear to have too much wind and this is very painful. Colicky babies tend to cry a lot, especially in the evening or after feeds.

Most cases of colic go by 3 months of age. However, babies who have had colic may develop sleep problems. If your child had colic you may have spent a lot of time rocking and holding him. Once the colic has gone, you should not have to use these methods to settle him to sleep but he may still want you to.

It can be hard to tell when the colic has gone. If your baby cries when you put him down and stops quickly when you pick him up the colic has probably gone. If your baby goes back to sleep quickly after being rocked or fed it is unlikely that colic is still the cause of the trouble.



Feeding During the Night

Night-time feeding can be the cause of a major sleep disturbance. As stated before, sometime between 3 months and 6 months, your baby should stop needing to be fed overnight. If your child wakes repeatedly after 6 months and has to be fed to go back to sleep then he is developing a sleep problem and the feeding is the cause.

If your child gets used to being fed during the night his body will begin to think of the night-time sleep periods only as naps between feeds.



Temperament

There are big differences in how much babies cry and how easy they are to calm down. Part of the difference may be explained by what we call the baby's temperament. With some babies you may have to work harder to encourage good sleeping habits. Some babies are more upset than others by noises and light or being wet or hungry.

You and Your Baby

By the age of 3-4 months most babies are, or could be, sleeping through most of the night. If your baby has not settled by 5-6 months you should take a close look at his bedtime routine. If your baby is always fed or rocked to sleep at bedtime he may have difficulty going back to sleep by himself after a normal night-time waking. You will remember that babies often wake during a period of light sleep, this is normal. All children learn to connect certain things with falling asleep. Being in the same bedroom, lying in a certain cot or holding a special toy or blanket can all be very important to your baby. The conditions are still the same when he wakes up at night and because they are, he feels secure and returns to sleep. However, if your baby depends on you to get him back to sleep he will cry until you get up to rock or feed him.



The Premature Baby

Some premature babies sleep a lot and others are restless. Premature babies have to make up for all the weeks they should have been in the womb. This means that they tend to take longer to sleep through the night.



A Word About Dummies

Dummies help some children to settle themselves to sleep. You may use one for your baby. **The problem is the dummy often falls out during sleep and your child may wake and cry out.** This means that you might have to get up many times every night to replace it.

You can let your baby suck his dummy to comfort himself before he goes to sleep. However it is probably a good idea to take it out of his mouth just before he falls asleep. If you do this he will get used to falling asleep without it in his mouth. Hopefully, if he wakes up during the night he won't cry out for you to replace it.

Medical Causes

Your baby's sleep may be upset at night because of medical problems. Any illness, especially with fever or pain can upset sleep patterns. After an illness some children slip back easily into smooth sleep patterns, others may carry on being wakeful.

In most cases sleep problems do not have a medical cause. If you are unsure consult your GP or health visitor.

How To Help Your Baby Sleep Well

As your baby gets older we have seen that there should be a change in his pattern of sleep. This change often starts in the first few weeks and by about four months your baby may sleep twice as much at night as during the day.

This section discusses some important things that will help your baby to sleep well. If your child falls asleep easily in his cot and does not usually wake up, your routine is working. However, your baby may be one that has not 'settled' and you may have to work a little harder than other parents to form good sleeping habits.

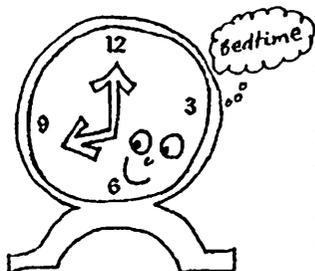


Sleep Problems Are Common

Many children develop sleep problems as they get older. These problems sometimes last for months, or even years. Armed with the information in this booklet, you can prevent problems starting, or at least help to solve a wakeful period as soon as possible.

Remember that babies, like adults, need different amounts of sleep and you must take this into account.

The Importance of Routine



After the first 3-4 months you should start a routine of settling your baby which he can get used to. It is important to make a clear difference between day and night and between times for sleeping and waking. When you are at home always put your baby to sleep in the same place.

If you feed or rock your child to sleep you may eventually have to do this before he will ever fall asleep. Don't let him fall asleep in your arms or on the settee, this is storing up trouble for later on as he gets older.

It is best after the first few months to put your baby in his cot while he is tired but still awake. He should get used to falling asleep without your help. You should tuck him in, say goodnight and leave quietly.

If it is possible it is a good idea to share the settling so that your baby doesn't depend on just one person.

Snuffles, Snores, Moans and Groans

If your baby cries a little or moans quietly when he is in bed don't rush back into the room. Some children do this as they are falling asleep and you may wake him just as he is dozing off.

You may also find that your baby makes little jerky movements when he is drifting into sleep. Some babies are more active than others, your baby may move around a lot in his cot and snore or snuffle. You have to get used to this or you will be running in and out to check him all night.

The Right Conditions For Sleep

As your baby gets older, the routines at bedtime continue to be important. If bedtime is a pleasant time your child will look forward to this time of the day. A routine for a young baby may include a bath, changing into night clothes, a feed, a cuddle and bed. Older children may enjoy some quiet play or a story or song. It is important to set a time when your child is usually put to bed.

Bedtime routines can be different and you will choose a routine that suits your family. It is important to follow this routine as much as you can.

You need to settle your child to sleep under the conditions that will stay the same all night. You don't want your baby to wake up upset or angry because the place he went to sleep has changed. He will also be upset if he wakes, and mum who nursed him to sleep is nowhere to be seen. Once your baby is asleep he will probably wake from a period of light sleep a few times during the night. You will remember that this was discussed before. If your baby is used to settling himself to sleep at bedtime he should drift off to sleep again without your help.



Comforters



Many children like to fall asleep holding a special toy or blanket and some children suck their thumb. These methods of settling can be a great comfort when your baby is alone, you will find that they help him to be separated from you. If your child does not have a special toy or blanket you can encourage him to accept one. **Reality is that you cannot always be there.**

Daytime Naps

As your baby gets older you can encourage certain times for daytime naps. A baby over 6 months old will usually have two naps. Your baby may have a nap in the middle of the morning and in the middle of the afternoon. **It is important when possible to put him in the same place that he sleeps at night. Again, don't rock or feed him to sleep. Put him down when he is drowsy but not asleep. The same applies as at night-time, he should learn to fall asleep without your help.**

Bedtime Problems

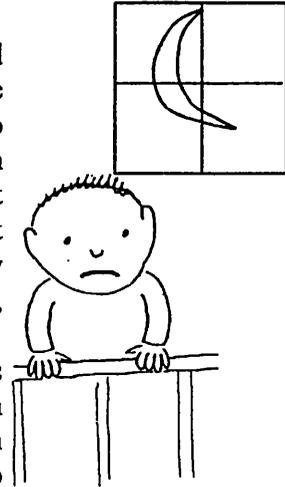
As your baby gets older he may get upset when you put him to bed. Children over 8 months often fight sleep because they want to stay up with their parents. To fall asleep means to be separated from those you love and trust. This is not an easy thing for your baby to learn. If he cries and you pick him up again he might start to cry every night for your attention. You may soon find that you are spending more and more time every night trying to get him to sleep.

What to Do

You should put your baby to bed, gently stroke his head for a few seconds, say good-night and leave quietly. If he cries, wait for a few minutes because he may drift off to sleep. If he continues to cry, go back into the bedroom but try not to lift him out of his cot. You should repeat what you did before, stroke him gently, say good-night and leave. If he keeps on crying you should return every few minutes and do as you did before, stroke his head, say good-night and leave.

If he is very upset you may have to take him out of his cot. You should sit quietly with him until he calms down and then put him back to bed. Don't put a bright light on and don't talk to him or he will want to stay awake to enjoy your company.

Babies learn very quickly. If you take him back out of his cot when he cries, he will learn to cry for this every night. If you are kind but firm and encourage him to stay in his cot you will soon have a baby that falls asleep quickly at bedtime.



Waking During the Night



If your baby wakes during the night and cries you should go to him quickly. If you let him cry for a while he may get so upset that it will take a long time to calm him down. There may of course be something wrong, he could have a dirty nappy or be teething for example. If there does not appear to be anything wrong try, if possible not to lift him out of his cot. Do as you did at bedtime, stroke his head gently, say good-night and leave. If he continues to cry return in a few minutes and do the same. Again, if he is very upset sit with him quietly until he calms down and then put him back to bed.

It is important to reassure him that your are there, but don't reward him with lots of attention or give him a feed or he will start to wake regularly.

On the next page you will find a summary of all the points discussed in this booklet.

The most important thing to remember is that a good bedtime routine will help your child to fall asleep easily and sleep well all night.

Summary

- Sleep problems are very common in children.
- Your baby has spells of light sleep and deep sleep during the night. During a spell of light sleep he will often wake up. You have to teach him, as he gets older to fall asleep again without crying for your help.
- A baby of 6 months and older should be able to sleep through the night. Many babies sleep for 10-12 hours overnight.
- Some babies seem to be irritable and sleep poorly from birth. A premature baby may take longer to settle. A baby who has suffered from colic may be more likely to develop sleep problems.
- After the first few months it is best to encourage a bedtime routine. You should teach your baby to settle without your help. Your baby will quickly learn the difference between day and night.
- If you rock your baby to sleep or feed him until he drops off he will need your help every time. This may mean you will have to get up many times during the night.
- The use of a favourite toy or blanket can help your baby to feel secure at night and settle if he wakes.



© Department of Nursing Studies University of Glasgow 1993
All rights reserved. No part of this publication may be
reproduced without the prior permission of the authors.

INTERVIEW SCHEDULE - MAIN STUDY

		1	[]
		2	[]
<u>SECTION A</u>			
1. In the past week which room did your baby sleep in for most or all of the night?			
same bedroom as parent/s	[] 1		
shared bedroom with brother/sister	[] 2		
shared bedroom with other person	[] 3	3	[]
alone in bedroom	[] 4		
other (specify) _____	[] 5		
2. In the past week what bed/place did your baby sleep in for all or most of the night?			
cot	[] 1		
shared bed with parent/s	[] 2		
shared bed with brother or sister	[] 3	4	[]
shared bed with other person	[] 4		
other (specify) _____	[] 5		

3. At the beginning of the night was this the place that you planned your baby would sleep?

- | | | |
|---------------|------------------|--------------|
| yes | [] ₁ | |
| no | [] ₂ | 5 [] |
| no preference | [] ₃ | |

4. In the past week what time did your baby go to bed most nights?

- | | | |
|-----------------------|------------------|--------------|
| 6-6.59pm | [] ₁ | |
| 7-7.59pm | [] ₂ | |
| 8-8.59pm | [] ₃ | |
| 9-9.59pm | [] ₄ | 6 [] |
| 10-10.59pm | [] ₅ | |
| 11-11.59pm | [] ₆ | |
| no fixed time | [] ₇ | |
| other (specify) _____ | [] ₈ | |

5. What time did you actually intend that he/she would go to bed most nights?

- 6-6.59pm [] 1
- 7-7.59pm [] 2
- 8-8.59pm [] 3
- 9-9.59pm [] 4
- 10-10.59pm [] 5
- 11-11.59pm [] 6
- no preference [] 7
- other (specify) _____ [] 8

7 []

6. If these times are different did you try to put him/her to bed at the time you intended?

- yes [] 1
- no [] 2
- no difference [] 3
- other [] 4

8 []

7. Was your baby normally asleep before you actually put him/her to bed?

yes 1

no 2

other (specify) _____ 3

9

(b) If yes, why do you settle him/her to sleep before you put him/her to bed?

10

(c) If yes, where did your baby actually fall asleep?

living room 1

parents bedroom 2

own bedroom 3

other (specify) _____ 4

11

(d) If yes, how long was your baby normally

asleep before you put him to bed?

0-15 minutes	<input type="checkbox"/> 1			
16-30 minutes	<input type="checkbox"/> 2			
31-45 minutes	<input type="checkbox"/> 3			
46-60 minutes	<input type="checkbox"/> 4		12	<input type="checkbox"/>
1-2 hours	<input type="checkbox"/> 5			
more than 2 hours	<input type="checkbox"/> 6			
other (specify) _____	<input type="checkbox"/> 7			

8. How do you get your baby to sleep in the evening/at bedtime?

	yes	no		
sleeps with parent/s	<input type="checkbox"/>	<input type="checkbox"/>	13	<input type="checkbox"/>
parent lies down with baby	<input type="checkbox"/>	<input type="checkbox"/>	14	<input type="checkbox"/>
fed (bottle)	<input type="checkbox"/>	<input type="checkbox"/>	15	<input type="checkbox"/>
fed (breast)	<input type="checkbox"/>	<input type="checkbox"/>	16	<input type="checkbox"/>
rocked	<input type="checkbox"/>	<input type="checkbox"/>	17	<input type="checkbox"/>
song/story	<input type="checkbox"/>	<input type="checkbox"/>	18	<input type="checkbox"/>
musical toy	<input type="checkbox"/>	<input type="checkbox"/>	19	<input type="checkbox"/>
toy	<input type="checkbox"/>	<input type="checkbox"/>	20	<input type="checkbox"/>
blanket	<input type="checkbox"/>	<input type="checkbox"/>	21	<input type="checkbox"/>
dummy	<input type="checkbox"/>	<input type="checkbox"/>	22	<input type="checkbox"/>
baby just put to bed	<input type="checkbox"/>	<input type="checkbox"/>	23	<input type="checkbox"/>
other (specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	24	<input type="checkbox"/>

**9. How long does it normally take for your child
to fall asleep in his/her own bed at night?**

- 0-15 minutes [] 1
- 16-30 minutes [] 2
- 31-45 minutes [] 3
- 46-60 minutes [] 4
- 1-2 hours [] 5
- more than 2 hours [] 6
- usually falls asleep before put to bed [] 7
- sleeps with another person [] 8
- other (specify) _____ [] 10

25 []

**10. How many nights in the past week has your
baby woken and cried for attention between
10pm-5am?**

- 0 [] 0
- 1 [] 1
- 2 [] 2
- 3 [] 3
- 4 [] 4
- 5 [] 5
- 6 [] 6
- 7 [] 7

26 []

11. How many times did your child normally wake per night? (on the nights that he/she woke)

- 0 (didn't wake) 0
- 1 1
- 2 2
- 3 3
- 4 4
- 5 or more 5
- other (specify) _____ 6

27 []

12. If your child did wake, how long did it normally take for him/her to get back to sleep again?

- did not wake 1
- 0-15 minutes 2
- 16-30 minutes 3
- 31-45 minutes 4
- 46-60 minutes 5
- 1-2 hours 6
- more than 2 hours 7
- other (specify) _____ 8

28 []

13. What method/s did you use to get your baby

back to sleep after he/she woke up?

	yes	no		
didn't wake	[]	[]	29	[]
in bed with parents	[]	[]	30	[]
fed (bottle)	[]	[]	31	[]
fed (breast)	[]	[]	32	[]
rocked	[]	[]	33	[]
song/story	[]	[]	34	[]
musical toy	[]	[]	35	[]
toy	[]	[]	36	[]
blanket	[]	[]	37	[]
dummy	[]	[]	38	[]
baby left alone	[]	[]	39	[]
other (specify) _____	[]	[]	40	[]

14. What time did your baby normally wake up in

the morning?

5-5.59am	[] ¹			
6-6.59am	[] ²			
7-7.59am	[] ³		41	[]
8-8.59am	[] ⁴			
other (specify) _____	[] ⁵			

15. What time would you like your baby to have woken in the morning?

- 5-5.59am 1
- 6-6.59am 2
- 7-7.59am 3
- 8-8.59am 4
- other (specify) _____ 5

42

16. On average, how many times per day did your baby take a nap?

- 0 0
- 1 1
- 2 2
- 3 3
- 4 4
- other (specify) _____ 5

43

17. How long did he/she normally sleep when

he/she took a nap?

am

didn't sleep []₁

<= 30 minutes []₂

31-60 minutes []₃

44 []

61-90 minutes []₄

91-120 minutes []₅

more than 2 hours []₆

pm

didn't sleep []₁

<= 30 minutes []₂

31-60 minutes []₃

45 []

61-90 minutes []₄

91-120 minutes []₅

more than 2 hours []₆

18. Where did your baby normally sleep when

he/she took a nap?

am

no nap [] 1

cot [] 2

pram [] 3

settee [] 4

other (specify) _____ [] 5

46 []

pm

no nap [] 1

cot [] 2

pram [] 3

settee [] 4

other (specify) _____ [] 5

47 []

19. How did you get your child to sleep for

his/her day-time nap?

am

	yes	no		
in bed with parent/s	[]	[]	48	[]
fed (bottle)	[]	[]	49	[]
fed (breast)	[]	[]	50	[]
rocked	[]	[]	51	[]
song/story	[]	[]	52	[]
musical toy	[]	[]	53	[]
toy	[]	[]	54	[]
blanket	[]	[]	55	[]
dummy	[]	[]	56	[]
just put to bed	[]	[]	57	[]
other (specify) _____	[]	[]	58	[]

pm

	yes	no		
in bed with parent/s	[]	[]	59	[]
fed (bottle)	[]	[]	60	[]
fed (breast)	[]	[]	61	[]
rocked	[]	[]	62	[]
song/story	[]	[]	63	[]
musical toy	[]	[]	64	[]
toy	[]	[]	65	[]
blanket	[]	[]	66	[]
dummy	[]	[]	67	[]
just put to bed	[]	[]	68	[]
other (specify)_____	[]	[]	69	[]

20. How happy are you with your baby's sleep pattern? (explain use of scale)

very unhappy ||||||| **very happy** **70** []

SECTION B

21. Sex of child

male

female

[]₁ []₂

71 []

22. Mother's age

<=14

[]₁

15-19

[]₂

20-24

[]₃

25-29

[]₄

72 []

30-34

[]₅

35-39

[]₆

40 +

[]₇

23. How many other children do you have?

0

[]₀

1

[]₁

2

[]₂

73 []

3

[]₃

4+

[]₄

other (specify) _____

[]₅

24. Members of the household (state number)

including the baby and yourself.

under 5 years of age	[]	74	[]
5-16 years of age	[]	75	[]
16 years +	[]	76	[]

25. Size of accomodation

1 bedroom	[] ¹		
2 bedrooms	[] ²		
3 bedrooms	[] ³	77	[]
4 bedrooms	[] ⁴		
5 bedrooms	[] ⁵		
other (specify) _____	[] ⁶		

26. What is the occupation of the 'head of the household'. (explain what is meant by this)

_____	78	[]

27. Were you well when you were pregnant? Please give details.

_____	79	[]

28. What type of delivery did you have?

- normal [] 1
- forceps [] 2
- suction (ventouse extraction) [] 3
- arranged caesarian section [] 4
- caesarian section (failure to progress) [] 5
- emergency caesarian section [] 6
- don't know [] 7

80 []

29. Was your baby well when he/she was born?

Please give details.

81 []

30. Has your baby had any problems with his/her health since birth? Please give details.

82 []

31. Has your baby been well in the past week?

Please give details.

83 []

**32. Are you bottle-feeding or breast-feeding
at present?**

bottle-feeding	[] ₁		
breast-feeding	[] ₂	84	[]
breast and bottle-feeding	[] ₃		

**33. Did you breast-feed your baby at all? If
you did how long did you feed your baby for?**

did not breast-feed	[] ₀		
< 1 week	[] ₁		
1 week < 6 weeks	[] ₂		
6 weeks < 3 months	[] ₃	85	[]
3 months < 6 months	[] ₄		
6 months +	[] ₅		

REFERENCES

- Anders, T F. (1979). Night Wakings in Infants During the First Year of Life. Pediatrics, **63**, 860-864.
- Anderson, S., Marshall, A. & Illman, L. (1987). A Sleep Problems Information Leaflet. Health Visitor, **60**, 297-298.
- Balfour, A. (1988). A Group for Parents who have Children with Sleeping Problems. Health Visitor, **61**, 316-318.
- Bax, M. C. O. (1980). Sleep Disturbance in the Young Child. British Medical Journal, **280**, 1177-1179.
- Bernal, J. F. (1973). Night Waking in Infants During the First 14 months. Developmental Medicine and Child Neurology. **15**, 760-769.
- Bernier, M. J. & Yasko, J. (1991). Designing and Evaluating Printed Education Materials: Model and Instrument Development. Patient Education & Counseling, **18**, 253-263.
- Blurton-Jones, N., Rossetti Ferreira, M. C., Farquar Brown, M. & MacDonald, L. (1978). The Association Between Perinatal Factors and Later Night Waking. Developmental Medicine and Child Neurology, **20**, 427-434.
- Boomer, H. (1991). Getting Children to Sleep. Nursing Times, **87**, 40-43.
- Breen, M. (1992). Writing For Your Audience. Health Promotion, **Summer**, 2-6.
- Brink, P. J. & Wood, M. J. (Eds.). (1989). Advanced Design in Nursing Research, London, Sage.
- Buckwalter, K. C. & Maas, M. L. (1989). True Experimental Design. In: P. J. Brink & M. J. Wood (Eds). Advanced Design in Nursing Research, London, Sage.
- Burns, N. & Grove, S. K. (1987). The Practice of Nursing Research: Conduct, Critique and Utilization, Philadelphia, W B Saunders.

- Campbell, M. & Machin, D. (1990). Medical Statistics - A Commonsense Approach, Chichester, John Wiley.
- Carey, W. B. (1974). Night Waking and Temperament in Infancy. Journal of Pediatrics, **84**, 756-758.
- Carey, W. B. (1975). Breast-feeding and Night Waking. Journal of Pediatrics, **87**, 327.
- Carpenter, A. (1990). Sleep Problems: A Group Approach. Health Visitor, **63**, 305-307.
- Carr, L. (1994). The Strengths and Weaknesses of Quantitative and Qualitative Research: What Method for Nursing? Journal of Advanced Nursing, **20**, 716-721.
- Carstairs, V. & Morris, R. (1991). Deprivation and Health in Scotland, Aberdeen, Aberdeen University Press.
- Caudill, W. & Plath, D. W. (1966). Who Sleeps by Whom? Parent-Child Involvement in Urban Japan's Families. Psychiatry, **29**, 344-366.
- Chavin, W. & Tinson, S. (1980). Children with Sleep Difficulties. Health Visitor, **53**, 477-480.
- Clements, J., Wing, L. & Dunn, G. (1986). Sleep Problems in Handicapped Children. Journal of Child Psychology & Psychiatry, **27**, 399-407.
- Cook, T. D. & Campbell, D. T. (Eds.). (1979). Quasi-experimentation: Design and Analysis Issues for Field Settings, Chicago, University of Chicago Press.
- Coolican, H. (1994). Research Methods and Statistics in Psychology, London, Hodder and Stoughton.
- Coons, S. & Guilleminault, C. (1982). Development of Sleep-Wake Patterns and Non-Rapid Eye Movement Sleep Stages During the First Six Months of Life in Normal Infants. Pediatrics **69**, 793-798.
- Cormack, D. F. S. (1984). The Research Process in Nursing, London, Blackwell Scientific Publications.

- Crawford, W., Bennet, R. & Hewitt, K. (1989). Sleep Problems in Pre-School Children. Health Visitor **62**, 79-81.
- Daws, D. (1993). Through the Night - Helping Parents and Sleepless Infants, London, Free Association Books.
- Dixon, E. & Park, R. (1990). Do Patients Understand Written Health Information? Nursing Outlook, **38**(6), 278-281.
- Dixon M (1992) Please Take a Leaflet. Nursing, **5**(5), 11-13.
- Douglas, J. & Richman, N. (1984). My Child Won't Sleep, London, Penguin.
- Douglas, J. (1987). Coping with Sleep Problems. Health Visitor, **60**, 52-53.
- Douglas, J. & Richman, N. (1985). Sleep Management Manual, London, The Department of Psychological Medicine, Great Ormond Street Children's Hospital.
- Downie, R. S., Fyfe, C. & Tannahill, A. (1990). Health Promotion, Oxford, Oxford University Press.
- Errante, J. (1985). Sleep Deprivation or Postpartum Blues? Topics in Clinical Nursing, **6**, 9-18.
- Ewles, L. & Simnett, I. (1992) Promoting Health: A Practical Guide to Health Education, Chichester, John Wiley.
- Ferber, R. (1985). Solve Your Child's Sleep Problems, London, Dorling Kindersley.
- Ferber, R. (1987(a)). The Sleepless Child. In: C Guilleminault (Ed). Sleep and It's Disorders in Children, New York, Raven Press.
- Ferber, R. (1987 (b)). Circadian and Schedule Disturbances. In: C. Guilleminault (Ed). Sleep and It's Disorders in Children, New York, Raven Press.
- Flesch, R. (1948). A New Readability Yardstick. Journal of Applied Psychology, **32**(3), 221-233.
- Gann, R. (1986). The Health Information Handbook, Aldershot, Gower.

- Galbraith, L., Hewitt, K. & Pritchard, L. (1993). Behavioural Treatment for Sleep Disturbance. Health Visitor, **66**(5), 169-171.
- Glasper, A. & Burge, D. (1992). Developing Family Information Leaflets. Nursing Standard, **6**(25), 24-27.
- Golding, J. & Fedrick, A. (1986). Infant Sleep Difficulties and Subsequent Development. Health Visitor, **59**, 245-246.
- Green, L. W. (1977). Evaluation and Measurement: Some Dilemmas for Health Education, American Journal of Public Health, **67**, 155-161.
- Haslam, D. (1992). Sleepless Children, London, Piatkus.
- Hewitt, K. & Galbraith, L. (1987). Postnatal Classes on Prevention of Sleeplessness in Young Children. Child: Care, Health and Development, **13**, 415-420.
- Hewitt, K. (1988 (a)). Behaviour Assessment by Health Visitors and Parents:(i) nine-month olds, Unpublished.
- Hewitt, K. (1988 (b)). Prevention of Behaviour Problems in Pre-School Children: Preliminary Considerations. Health Visitor, **61**, 181-183.
- Horne, J. (1992). Sleep and its Disorders in Children. Journal of Child Psychology & Psychiatry, **33**, 473-487.
- Jenkins, S. (1980). Behaviour Problems in the Young Child. Health Visitor, **53**, 463-465.
- Jones, D. P. H. & Verduyn, C. M. (1983). Behavioural Management of Sleep Problems. Archives of Disease in Children, **58**, 442-444.
- Kahn, A., Rebuffat, E., Blum, D., Casimir, G., Duchateau, J., Mozin, M. J. & Jost, R. (1987). Difficulty in Initiating and Maintaining Sleep Associated with Cow's Milk Allergy in Infants. Sleep, **10**, 116-121.
- Kataria, S., Swanson, M. & Trevathon, G. E. (1987). Persistence of Sleep Disturbances in Preschool Children. Journal of Pediatrics, **110**, 642-646.

Kitzinger, M. & Hunt, H. (1985). The Effect of Residential Setting on Sleep and Behaviour Patterns of Young Visually-Handicapped Children. In: J. Stevenson (Ed). Recent Research in Developmental Psychopathology, Oxford, Pergamon Press.

Klare, G. R. (1976). A Second Look at the Validity of Readability Formulae. Journal of Reading, **8**, 129-52.

Ley, P., Bradshaw, P. W., Eaves, D. & Walker, C. M. (1973). A Method for Increasing Patients' Recall of Information Presented by Doctors. Psychological Medicine, **3**, 217-220.

Ley, P. & Morris, L. (1984). Psychological Aspects of Written Information for Patients. In: S Rachman (Ed). Contributions to Medical Psychology, Oxford, Pergamon.

Lozoff, M., Wolf, A. W. & Davis, N. S. (1985). Sleep Problems Seen in Pediatric Practice. Pediatrics, **75**, 477-483.

McMahon, R. J. & Forehand, R. (1980). Self-Help Behavior Therapies in Parent Training. In: B. Lakey & A. Kazdin (Eds). Advances in Clinical Child Psychology, New York, Plenum Press.

Machin, D. & Campbell, M. (1987). Statistical Tables for the Design of Clinical Trials, London, Blackwell Scientific.

Meade, C. & Smith, C. (1991). Readability Formulas: Cautions and Criteria. Patient Education and Counseling, **17**, 153-158.

Metcalf, D., Mondale, J. & Butler, F. (1971). Ontogenesis of Spontaneous K-Complexes. Psychophysiology, **8**, 340-347.

Minde, K., Popiel, K., Leos, N., Falkner, S., Parker, K. & Handley-Derry, M. (1993). The Evaluation and Treatment of Sleep Disturbances in Young Children. Journal of Child Psychology and Psychiatry, **34**(4), 521-533.

Moore, M. S. & Ucko, L. E. (1957). Night Waking in Early Infancy: Part 1. Archives of Disease in Childhood, **32**, 333-342.

Mrazek, D., Anderson, I. & Shrunk, R. (1985). Disturbed Emotional Development in Severely Asthmatic Preschool Children, In: J. Stevenson (Ed). Recent Research in Developmental Medicine, Oxford, Pergamon Press.

- Naidoo, J. & Wills, J. (1994). Health Promotion - Foundations for Practice, London, Bailliere Tindall.
- OPCS. (1991). Standard Occupational Classification, London, HMSO.
- Oppenheim, A. N. (1992). Questionnaire Design, Interviewing and Attitude Measurement, London, Pinter.
- Osterholm, P., Lindeke, L. & Amidon, D. (1983). Sleep Disturbance in Infants Aged 6 to 12 Months. Pediatric Nursing, **9**, 269-272.
- Parmelee, A. H., Wenner, W. H. & Schulz, H. R. (1964). Infant Sleep Patterns: From Birth to 16 Weeks of Age. Journal of Pediatrics, **65**, 576-582.
- Pastore, P. O. & Berg, B. K. (1987). The Evaluation of Patient Education Materials: Focus on Readability. Patient Education and Counselling, **9**(2), 216-219.
- Pocock, S. (1983). Clinical Trials - A Practical Approach, Bath, Pitman Press.
- Polit, D. & Hungler, B. (1991). Nursing Research: Principles and Methods, Philadelphia, Lippincott.
- Pound, R. (1989). Help Your Child to Sleep, Bath, Millstream.
- Rowntree, D. (1981). Statistics Without Tears, London, Penguin.
- Quinn, L., Wade, K. & Hargreaves, R. (1991). Learning to Sleep. Nursing Times, **87**, 41-43.
- Reading and Language Information Centre. (1992). Consumer Leaflets - A Write Off? London, Shire Hall Communications.
- Richards, E., Bidder, R. T. & Gardner, S. (1992). Sleep Clinics with Health Visitors: A 2-Year Evaluation. Child: Care, Health and Development, **18**(6), 395-404.
- Richards, M. & Bernal, J. (1974). Why Some Babies Don't Sleep. New Society, 28 Feb. cited in: Haslam, D. (1992). Sleepless Children, London, Piatkus. p144.

- Richman, N., Stevenson, J. E. & Graham, P. J. (1975). Prevalence of Behaviour Problems in 3 Year Old Children: An Epidemiological Study in a London Borough. Journal of Child Psychology and Psychiatry, **16**, 277-287.
- Richman, N. (1981). A Community Survey of One to Two Year Year-Olds with Sleep Disruptions. Journal of the Academy of Child Psychiatry, **20**, 281-291.
- Richman, N. (1985). A Double-Blind Drug Trial in Young Children with Waking Problems. Journal of Child Psychology and Psychiatry, **26**, 591-598.
- Richman, N., Douglas, J., Hunt, H., Lansdown, R. & Levere, R. (1985). Behavioural Methods in the Treatment of Sleep Disorders - A Pilot Study. Journal of Child Psychology and Psychiatry, **26**, 581-590.
- Richman, N. (1986). Recent Progress in Understanding and Treating Sleep Disorders. Advances in Developmental and Behavioural Pediatrics, **7**, 45-63.
- Roberts, S. (1993) Tackling Sleep Problems Through a Clinic Based Approach. Health Visitor, **66**(5), 173-174.
- Rudestam, K. E. & Newton, R. R. (1992). Surviving Your Dissertation, London, Sage.
- Scott, G. & Richards, M. P. M. (1990 (a)). Night Waking in 1-year-old Children in England. Child: Care, Health and Development, **16**, 283-302.
- Scott, G. & Richards, M. P. M. (1990 (b)). Night Waking in Infants: Effects of Providing Advice and Support for Parents. Journal of Child Psychology and Psychiatry, **31**, 551-567.
- Seymour, F. W., Brock, P., During, M. & Poole, G. (1989). Reducing Sleep Disruptions in Young Children: Evaluation of Therapist Guided and Written Information Approaches. Journal of Child Psychology & Psychiatry, **30**, 913-918.
- Sherwood, C. D., Morris, J. N. & Sherwood, S. (1975). A Multivariate, Non-Randomized Matching Technique for Studying the Impact of Social Interventions. In: E. L. Struening & M. Guttentag (Eds.). Handbook of Evaluation Research, Beverley Hills, Sage.
- Silver, R. (1991). Better Information Literature for Hospital Patients, Kent, Bailey.

Szyndler, J. & Bell, G. (1992). Are Groups for Parents of Children with Sleep Problems Effective? Health Visitor, **65**(8), 277-279.

Tirosh, E., Scher, A., Sadeh, A., Jaffe, M. & Lavie, P. (1993). The Sleep Characteristics of Asthmatics in the First Four Years of Life: A Comparative Study. Archives of Disease in Childhood, **68**, 481-483.

Treece, E. W. & Treece, J. W. (1986). Elements of Reseach in Nursing, Missouri, C V Mosby.

Tucker, I. G. & McArthur, K. (1977). The Sleep Patterns of Pre-School Hearing-Impaired Children. Journal of the British Association of Teachers of the Deaf, **1**, 2-7.

Ungerer, J. A., Sigman, M., Beckwith, L., Cohen, S. & Parmelee, A. (1983). Sleep Behavior of Preterm Children at 3 Years of Age. Developmental Medicine & Child Neurology, **25**, 297-304.

Walker, J. (1989). The Behaviour of 3-Year-Old Children Who Were Born Preterm. Child: Care, Health & Development, **15**, 297-313.

Walters, J. (1993). Sleep Management - The Hidden Agenda. Child: Care, Health and Development, **19**, 197-208.

Weir, I. K. & Dinnick, S. (1988). Behaviour Modification in the Treatment of Sleep Problems Occurring in Young Children: A Controlled Trial Using Health Visitors as Therapists. Child: Care, Health and Development, **14**, 355-367.

Wright, P., MacLeod, H. & Cooper, M. (1983). Waking at Night: The Effect of Early Feeding Experience. Child: Care, Health and Development, **9**, 309-319.

