The effect of 'environmental manipulation' on agitation and 24-hour sleep in dementia sufferers in an institutional setting

Ernest A. Matthews
Edith Cowan University

Follow this and additional works at: https://ro.ecu.edu.au/theses

Part of the Geriatric Nursing Commons

Recommended Citation

This Thesis is posted at Research Online. https://ro.ecu.edu.au/theses/1146
Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.

- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author’s moral rights contained in Part IX of the Copyright Act 1968 (Cth).

- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.
The Effect of 'Environmental Manipulation' on Agitation and 24-Hour Sleep in Dementia Sufferers in an Institutional Setting

By
Ernest A. Matthews, B.A., BHSc., M.N. Student

A Thesis Submitted in Partial Fulfilment of the Requirements for the Award of

Master of Nursing
at the School of Nursing, Edith Cowan University

Date of Submission: 26th July, 1993
USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.
Table of Contents

Abstract .......................................................................................................... i
Declaration ...................................................................................................... ii
Acknowledgements ......................................................................................... iii
List of Tables .................................................................................................. iv
List of Figures ................................................................................................ v

CHAPTER ONE ........................................................................................... 1

Introduction ................................................................................................. 1

1.1 Background of the Study........................................................................ 1
1.2 Purpose of the Study ............................................................................. 5
1.3 Research Questions .............................................................................. 5
1.4 Significance of the Study ..................................................................... 5
1.5 Conceptual Definitions ....................................................................... 6

CHAPTER TWO ........................................................................................... 8

Literature Review .......................................................................................... 8

2.1 Background .......................................................................................... 8
2.2 Agitation ................................................................................................ 9
  2.2.1 The Concept of agitation ......................................................... 9
  2.2.2 Classifying and assessing agitation ....................................... 10
2.3 Prevalence of Agitation in Dementia Sufferers ................................... 11
2.4 Agitation and Cognitive Impairment ................................................... 12
2.5 Predictors of agitation ........................................................................ 13
  2.5.1 Predisposing factors ................................................................. 13
  2.5.2 Precipitating factors ................................................................. 15
2.6 Summary ............................................................................................. 16
2.7 Management of Agitation .................................................................... 16
  2.7.1 Pharmacologic intervention ............................................... 17
  2.7.2 Physical Restraints ................................................................. 18
  2.7.3 Interpersonal Interaction ...................................................... 18
  2.7.4 Environmental Manipulation ............................................. 21
2.8 Summary ............................................................................................. 24
2.9 Sleep Pattern Disturbance ................................................................... 25
  2.9.1 Sleep in the elderly ................................................................. 25
CHAPTER THREE

Methodology

3.1 Research Design

3.2 Setting

3.3 Subjects

3.4 Instruments

3.4.1 Demographic information sheet

3.4.2 Cohen-Mansfield Agitation Inventory (CMAI)

3.4.3 Sleep scale

3.4.4 Brief Cognitive Rating Scale (BCRS)

3.5 Intervention

3.5.1 Task-oriented care module

3.5.2 Client-oriented care module

3.6 Implementation of new care module

3.7 Procedure

3.8 Ethical Considerations

CHAPTER FOUR

Results

4.1 Agitation Level

4.1.1 Aggressive behaviours

4.1.2 Non-aggressive physical agitation

4.1.3 Verbal agitation

4.1.4 Other agitated behaviours

4.2 Descriptive analysis of agitation

4.2.1 Effect of intervention on agitation

4.2.2 Frequency of specific agitated behaviours

4.2.3 Level of agitation among participants

4.2.4 Agitation and cognitive status

4.3 Sleep

4.3.1 Sleep by day

4.3.2 Sleep by night

4.3.3 Sleep over 24 Hours
Discussion

5.1 Summary of findings ................................................................. 58
5.2 Decreased verbal agitation on the early shift ........................ 60
5.3 Change in verbal agitation on the late shift ......................... 61
5.4 Increase in 'other agitated' behaviours on the early shift .... 61
5.5 Other categories of agitation .................................................. 62
5.6 Effect of intervention on agitated behaviours ....................... 62
5.7 Frequency of agitated behaviours ......................................... 63
5.8 Difference in agitation level between early and late shifts .. 64
5.9 Agitation and cognitive status ............................................... 66
5.10 Sleep by day ....................................................................... 67
5.11 Sleep by night ................................................................. 68
5.12 Limitations of the study ..................................................... 69
5.13 Conclusion ........................................................................ 70
5.14 Nursing implications .......................................................... 71
5.15 Recommendations for future studies ................................. 72

REFERENCES .............................................................................. 73

APPENDICES

A Sociodemographic Information
B Cohen-Mansfield Agitation Inventory
C Sleep Scale
D Brief Cognitive Rating Scale
E Letter to Ethical Review Committee
F Letter to Director of Nursing
G Letter to Next-of-Kin
H Consent Form
Abstract

Living in an institutional setting places on residents certain constraints in relation to freedom of choice as to when, where, and how they conduct activities of daily living, such as, sleeping, eating, and attending to hygiene needs. Studies indicate this loss of control over the environment contributes to loss of self-esteem, leads to stress, and at times precipitates agitation among nursing home residents. Cognitive impairment may render dementia sufferers more vulnerable to loss of control over their environment and result in agitation, which may in turn influence sleep. The study therefore, investigated if 'environmental manipulation' as in introducing flexibility in place of strict time schedules affected agitation and 24-hour sleep in 33 institutionalised dementia sufferers. The Cohen-Mansfield Agitation Inventory (CMAI) and the sleep scale included in the Dementia Mood Assessment Scale were used to quantify agitation and 24-hour sleep respectively. A 'within-subject' longitudinal time design comprising 4 phases was used with each phase covering 4 weeks. 'Environmental manipulation' was introduced following phase 2.

Agitation was examined under 4 categories: aggressive, non-aggressive, verbally agitated, and 'other agitated' behaviours. A significant reduction in verbal agitation and a significant increase in 'other agitated' behaviours were observed on the early nursing shift. Descriptive statistics indicated a reduction in total agitated behaviours following the intervention on the early shift. Although 24-hour sleep as well as day sleep increased significantly immediately following the intervention, they returned to pre-intervention levels in phase 4. Night sleep was not affected.

Findings of the study are of considerable clinical significance as there are few empirically validated nursing interventions to manage agitation and fragmented sleep in dementia sufferers.
Declaration

"I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text"

Signature...

Date 26th July, 1993
Acknowledgements

I would like to extend my sincere appreciation and heartfelt thanks to:

* Gerry Farrell, Dr Patricia Percival, and Dr Amanda Blackmore for the guidance and support I received in preparing this thesis.

* Dr Jiska Cohen-Mansfield (USA) for granting me permission to use the Cohen-Mansfield Agitation Inventory and for providing me with relevant literature on agitation.

* Dr Ivo Abraham (USA) for permission to use the sleep scale.

* The Director of Nursing, the four nurses, who collected the data for the study, and all the nurses of the nursing home where the study was conducted for their enthusiasm and co-operation.

* My colleagues at Selby Lodge, Shenton Park, W. Australia, for their encouragement, support, and help.

* My children, Victor, Nigel, and Michelle, for their support, understanding, and sacrifice.
## List of Tables

1. Longitudinal Time Design ........................................... 32
2. Socio-demographic Characteristics of Subjects .......... 34
3. Percentage of Subjects Exhibiting Agitated Behaviour at a frequency of at Least Once a Week .......... 52
4. Mean Number of Agitated Behaviours Exhibited at Least Once a Week per Participant Across 3 Nursing Shifts ............ 53
List of Figures

1. Conceptual model: person-environment congruence 30
2. Effect on aggressive behaviours on the early shift 43
3. Effect on aggressive behaviours on the late shift 43
4. Effect on aggressive behaviours on the night shift 44
5. Effect on nonaggressive behaviours on the early shift 44
6. Effect on nonaggressive behaviours on the late shift 45
7. Effect on nonaggressive behaviours on the night shift 45
8. Effect on verbal agitation on the early shift 46
9. Effect on verbal agitation on the late shift 47
10. Effect on verbal agitation on the night shift 47
11. Effect on other agitated behaviours on the early shift 48
12. Effect on other agitated behaviours on the late shift 49
13. Effect on other agitated behaviours on the night shift 49
14. Agitated behaviours occurring at least once a week 51
15. Effect on sleep by day 55
16. Effect on sleep by night 56
17. Effect on 24-hour sleep 57
CHAPTER ONE

Introduction

1.1 Background of the Study

A common clinical feature of dementia is agitation, which is described as "an excessive motor activity, often nonpurposeful in nature and commonly associated with feelings of internal tension, irritability, hostility, and belligerence" (Struble & Sivertsen, 1987, p. 40). It is a broad term that includes a number of different behaviours (Roper, Shapira, & Chang, 1991) some of which may be disruptive to the ward milieu such as aimless wandering, interfering with other residents and their belongings, noisiness, resistiveness and inappropriate and exaggerated emotional responses, described as "catastrophic reactions" (Maas, 1988, p. 58). Cognitive impairment in dementia sufferers renders them less able to interpret environmental stimuli (Lubinski, 1991; Gilleard, 1984) and as a result they experience a degree of stress, which is exhibited as agitated behaviour (Hall & Buckwalter, 1987). Both the literature and anecdotal notes indicate that agitated behaviours among some dementia sufferers may increase as the day progresses and peak towards late evening. This phenomenon is referred to as the "sundowning syndrome" (Hall, Korschling, & Todd, 1986; Sherman, 1991). It is suggested that the influx of environmental stimuli and subsequent buildup of stress over the course of the day may contribute towards 'sundowning syndrome' (Hall & Buckwalter, 1987).

While agitation poses a challenge to nurses caring for clients suffering from dementia there is a modicum of information available to guide nurses in its effective management (Struble and Sivertsen, 1987).
Much of the existing literature is speculative and anecdotal (Beck and Heacock, 1988). This lack of empirically tested advice has prompted Ford, Fox, Fitch, and Donovan (1983) to assert that any success in nursing management of agitation may be more the outcome of "enthusiasm and dedication" of the individual nurses, rather than the effectiveness of the actual intervention (p. 27).

Three main types of nursing strategies: physical or chemical intervention, interpersonal interaction, and environmental manipulation are used to control agitation in dementia sufferers (Roper, Shapira, and Chang, 1991). According to Kikuta (1991), nurses rely increasingly on the use of physical restraints, which may expose the clients to such potential risks as "functional decline, injury from falls, emotional desolation, skin abrasions and breakdown, disorganized behaviour, and possibly increased mortality" (p. 4). Chemical restraint in the form of medication is also widely used. Kikuta (1991) cautions against the use of this strategy as psychotropic drugs generally used to manage problematic behaviour tend to produce detrimental side effects. On the other hand, the use of sleep medication as an alternative to psychotropic drugs to manage agitation at night is likely to exacerbate the confusion (Fraser, 1987; Herr & Mobily, 1991). Paradoxically, drugs used to promote sleep in dementia sufferers are often the very cause of the insomnia that is being treated (Beck & Heacock, 1988). Hills (1990) therefore, suggests that non-pharmacological strategies need to be investigated in order to manage agitation particularly at night.

Interpersonal interaction as a strategy encourages nurses to use such interpersonal skills as listening, comforting and reassuring their clients. Furthermore, it proposes the use of reality orientation or validation therapy, depending on the level of cognitive impairment of the client, to cope with agitation arising from disorientation. It is suggested that reality orientation
will minimise agitation in dementia sufferers by reducing confusion, particularly in relation to their surroundings. However, awareness of their surrounding may bring with it the reality of their predicament which, instead of decreasing their stress, may, in fact, exacerbate it. In addition, Dietch, Hewett, and Jones (1989) question the usefulness of reality orientation as it entails constant challenging and stimulation which may contribute to agitation. As regards validation therapy, although it may be a useful technique in coping with a confused and agitated client, because it relies much on the skill of the individual nurse, success may not always be assured.

An alternative strategy proposed in the literature is that of 'environmental manipulation', that is, adapting "the physical, psychological, and personal surroundings of the patient to meet the needs of the patient rather than those of the home or institution" (Roper, Shapira, & Chang, 1991, p. 17). Environmental manipulation as a strategy stems from the concept of person/environment congruence or fit to achieve well-being (Lewin, 1951). It is suggested that if the environment is in keeping with what is normal for the individual this will result in less stress for the individual and as a consequence there will be less agitation. An important aspect in the implementation of environmental manipulation is facilitating freedom of choice for clients. Brehm (1966) suggests that an individual will always try to regain freedom of choice and control over his environment and in the process he may react either verbally or physically (Meddaugh, 1990). In view of this, it is hypothesised that agitation in dementia sufferers may to some extent arise from institutional constraints placed on them, such as rigid time schedules for sleeping, partaking of meals, and attending to hygiene needs. Environmental manipulation suggests that as far as possible clients are encouraged to decide about their activities of daily living in relation to when, where, and how they will
undertake them, such as going to bed and getting up, eating their meals, having a shower or having a walk. The few studies that have attempted to measure the success of environmental manipulation have not been subject to empirical evaluation.

What is required, therefore, is an empirical study that compares patient agitation pre and post implementation of an 'environmental manipulation' strategy.

Another clinically important aspect of nursing care is the management of disrupted sleep in dementia sufferers. Studies indicate that elderly people experience more frequent night awakenings and longer wake periods than young adults (Prinz, 1977; Reynolds, Kupfer, Taska, Hoch, Sewitch, & Spiker, 1985). However, compared with normal healthy elderly people, dementia sufferers experience even greater difficulty in achieving and maintaining sleep (Feinberg, 1974; Kahn & Fisher, 1969). While fragmented sleep pattern is a distinctive feature of dementia sufferers (Aharon-Peretz et al.; Hoch, Reynolds III, & Houck, 1988), there is a modicum of information on nursing management of sleep and rest in normal elderly people and even less in relation to dementia sufferers.

The literature and anecdotal notes in describing 'sundowning syndrome' indicate that some dementia sufferers are more agitated, that is, less relaxed towards the latter part of the evening. An essential factor for sleep to occur is both physical and mental relaxation (Coates & Thoresen, 1977). Hall and Buckwalter (1987) report that anecdotal evidence suggests that the provision of structured rest periods during the day has resulted in reduced agitation level in the evening and improved sleep at night among dementia sufferers. If, therefore, environmental manipulation is successful in reducing clients' agitation it might be expected that clients' sleep would also be affected.
1.2 Purpose of the Study

The study investigated if by removing institutional constraints, that is, allowing dementia sufferers flexibility in conducting their activities of daily living, agitated behaviour was affected. The effect on clients' 24-hour sleep was also investigated.

1.3 Research Questions

Does 'environmental' manipulation have a bearing on agitation in dementia sufferers?

Does 'environmental' manipulation affect the 24-hour sleep of dementia sufferers?

1.4 Significance of the Study

The significance of the proposed study may be viewed from several aspects. There is an urgent need to develop sound nursing practice in dementia care. Our Australian population is rapidly ageing (Graycar, 1988). Whether dementia is age-related (Adams, 1990) or age-dependent (Jorm, 1990), one consequence of an ageing population is an increase in the incidence of dementia (Abraham, Buckwalter, & Neundorfer, 1988; Jorm & Henderson, 1990; Osimani & Freedman, 1991). While the estimates of the prevalence and incidence of dementia are of concern, they are only conservative. The actual figures could be much higher as it is difficult to discern between the effects of ageing and dementia (Burns & Buckwalter, 1988; Jorm & Henderson, 1990; Khachaturian, 1990; Adams, 1990).

Comfort and safety of the client are important components of quality comprehensive health care. Agitation has the potential to jeopardise both the comfort and safety of not only the agitated client but
also that of fellow residents and staff. It is therefore imperative "to identify nursing interventions that decrease the probability of the occurrence of agitated episodes" (Struble & Sivertsen, 1987, p.44).

The inability of the family to cope with agitation is a major reason for admission of dementia sufferers into institutional care (Fraser, 1987). According to current figures, 48% of dementia sufferers are to be found in nursing homes, hostels or other mental health establishments (Mid-Term Review of Aged Care Reform Strategy, 1991, p. 61). Among problems encountered by carers, agitated behaviour in dementia sufferers has been found to be least tolerated and management of such behaviour poses a difficult challenge to them (Struble & Sivertsen, 1987). Furthermore, the ineffectiveness of nursing interventions for agitation has a negative effect on nursing staff (Taft, 1989; Fopma-Loy, 1989) and contributes to staff burnout (Maas, 1988; Fopma-Loy, 1989).

Finally, the findings of the proposed study may offer nurses an improved understanding of sleep in dementia sufferers.

1.5 Conceptual Definitions

**Dementia sufferer:** An individual who is medically diagnosed as suffering from any one of the different types of dementia.

**Agitation:** "An inappropriate verbal, vocal, or motor activity that is not explained by needs or confusion" (Cohen-Mansfield & Billig, 1986, p. 712).

**'Environmental' manipulation:** The introduction of freedom of choice as to when, where, and how a dementia sufferer performs 'activities of daily living' (ADLs), such as sleeping, eating, attending to hygiene, and relaxing.
Institutional setting: A long-term health care facility as in a nursing home.

24-Hour sleep: Sleep across the three nursing shifts: early, late, and night, estimated from the following perspectives: difficulty in falling asleep, frequency and duration of wake periods at night, length of uninterrupted sleep, early morning awakenings, drowsiness during the day, and daytime napping.
CHAPTER TWO

Literature Review

2.1 Background

Much of our healthcare resources is now diverted to the care of dementia sufferers (Graycar, 1988), who are predominantly the elderly (Jorm & Henderson, 1990). The elderly (65 years and over) comprise about 9% of the total population (Sainsbury & Lambeth, 1988), that is, about 1,590,234 of the current national figure of 17,335,933. It is estimated that by the year 2006, while our national population will increase by 24%, the number of the elderly is expected to grow by 44.4% (Fowke, 1990). According to Gray-Vickery (1988), by the age of 65, one in 20 people are demented, by 75, one in 10, and by 90, it may be as high as one in three. In Perth, Western Australia, research indicates that 25% of individuals, 70 years and over, suffer from mild dementia (Mowry & Burvill, 1988). In view of this potential increase in dementia sufferers, it is imperative that we take steps now to ensure that the care of dementia sufferers is based on sound empirically tested nursing practice.

One area of care is the management of agitation which is a common and distinctive clinical feature of dementia (Kaplan & Sadock, 1985; Sainsbury & Lambeth, 1988; Steffes & Thralow, 1985). Another is the management of fragmented sleep that is often experienced by dementia sufferers (Aharon-Peretz et al., 1991; Feinberg, Koreshko, & Heller, 1967; Hoch, Reynolds III, & Houck, 1988; Prinz, 1982). To formulate appropriate and effective management programmes it is
essential that nurses are familiar with findings of studies pertaining to
dementia, particularly in relation to agitation and fragmented sleep.

2.2 Agitation

2.2.1 The Concept of agitation.

Although agitation is a concept, the term is widely used by
clinicians to denote behaviours that are agitated, disruptive, resistive,
combative or aggressive (Roper, Shapira & Chang, 1991; Struble &
Sivertsen, 1987). Terms other than agitation, such as, 'abnormal
behaviours' (Cooper, Mungas & Weiler, 1990), "behavioural excesses
and problems of stimulus control...disruptive behaviours or simply
behavioural problems" are also used to describe similar behaviours
(Cohen-Mansfield, 1989, p. 101). Some of these terms may be
restrictive in their application. One example is the use of the term
'behaviour disturbance' by Baumgarten, Becker, and Gauthier (1990) to
refer only to those behaviours that tend to cause stress to the care-giver.
One consequence of the use of different terms and their varying
applications has been the lack of a commonly accepted definition of
suggest that because the term 'agitation' has a global application, any
definition of agitation should incorporate the multidimensional nature of
agitated behaviours as well as their interpretation by observers.

While recognising the difficulty of formulating a universally
acceptable definition of agitation, Cohen-Mansfield and Billig (1986)
postulated that a definition of agitation needs to meet the following
criteria: (a) to be operational and based on observable behaviour; (b) to
exclude behaviours that are recognised as arising from factors other than
agitation; and (c) to exclude behaviours that have explanations that are
obviously distinct from agitation. They, therefore, defined agitation as
"inappropriate verbal, vocal, or motor activity that is not explained by needs or confusion per se" (p. 712).

2.2.2 Classifying and assessing agitation.

Several studies have classified the wide range of behaviours linked with agitation. Hussian (1981) uses a behavioural approach and categorises agitated behaviours as 'behavioural excesses', 'problems of stimulus control', and 'self-stimulatory behaviour'. Agitated behaviours may have an impact on others. Accordingly, Zimmer, Watson, and Treat (1984) classify agitated behaviours under 'behaviours endangering others', 'behaviours endangering self', 'behaviours disturbing to others', and 'nonendangering or disturbing to others but of concern to staff'. Struble and Sivertsen (1987), instead, categorise agitated behaviours as "psychomotor behaviours (18 items), aggressive/antisocial behaviours (8 items), speech patterns (11 items), and physiological behaviours (8 items)" (p. 41). Roper, Shapira, and Chang (1991) classify agitated behaviours under the following self-care categories: rest and activity, solitude and social interaction, activities of daily living, and risks and hazards. Cohen-Mansfield, Marx, and Rosenthal (1989) categorise agitated behaviours as 'physically aggressive behaviours', 'physically nonaggressive behaviours', 'verbally agitated behaviours', and 'hoarding and hiding behaviours'.

In the past, discussion, monitoring and recording of agitation were descriptive in nature and tended to be "based on a physician's general impression" (Cohen-Mansfield, 1989, p. 103). Although some tools to measure agitation were available, they were part of a larger instrument. However, recent scientific interest in agitation has generated studies on agitation that have mainly concentrated on developing appropriate tools to identify, assess, and quantify incidents of agitated behaviour and to
monitor and record physical and chemical interventions used in coping with agitation (Roper, Shapira, and Chang, 1991; Struble and Sivertsen, 1987). According to Cohen-Mansfield (1989), two types of assessment instruments are now available: rating scales and checklists and observational instruments. One example of a rating scale is the Cohen-Mansfield Agitation Inventory (CMAI), developed by Cohen-Mansfield and Billig (1986). The CMAI lists 29 agitated behaviours. Nurses familiar with the patients rate the behaviours on a 7-point scale of frequency, with '1' indicating never and '7', several times an hour. In contrast, observational instruments involve behaviour-mapping techniques and time-sampling methods (Cohen-Mansfield, Werner, & Marx, 1989; Evans, 1987; Hussian & Hill, 1980; Mishara & Kastenbaum, 1973; Vaccaro, 1988). However, they are more intricate and time consuming and require trained observers (Cohen-Mansfield, 1989) and as a consequence are difficult to apply in many nursing contexts.

The current study has adopted the CMAI to measure agitation. The instrument is simple to use, easy to understand, involves minimal time, and has been extensively used since 1986 by Cohen-Mansfield and associates in their on-going studies on agitation in nursing situations.

2.3 Prevalence of Agitation in Dementia Sufferers

Studies have clearly established the prevalence of agitation in dementia sufferers (Baumgarten, Becker, & Gauthier, 1990). A recent study by Cohen-Mansfield, Marx and Rosenthal (1989) indicated that 93% of 408 elderly nursing home residents displayed one or more agitated behaviours at least once a week during at least one of the nursing shifts. Another important finding was that most agitated behaviours occurred on the early shift, with the night shift recording the
least. Of the 29 agitated behaviours that were monitored, general restlessness was most common on all three nursing shifts. Pacing, cursing, constant requests for attention, repetitive sentences or questions, complaining, and negativism were other most frequently occurring agitated behaviours.

2.4 Agitation and Cognitive Impairment

In the wake of clear evidence indicating a high prevalence of agitation among dementia sufferers, several researchers have investigated the relationship between agitation and cognitive impairment (Dawson & Reid, 1987; Hussien & Hill, 1980; Meddaugh, 1987; Ryden, 1986). The findings of these studies indicate a correlation between cognitive impairment and agitation. This relationship has been further examined by Cohen-Mansfield, Marx, and Rosenthal (1990) in their study which involved 408 nursing home residents including 323 with some degree of cognitive impairment. Tools used were the Brief Cognitive Rating Scale (BCRS; Reisberg, Schneck, Ferris, Schwartz, & de Leon, 1983) to measure level of cognitive impairment, and the Cohen-Mansfield Agitation Inventory (Cohen-Mansfield & Billig, 1986) to measure agitation. Behaviours listed as agitation were classified under four categories (i.e., physically aggressive, nonaggressive, verbally aggressive, hiding or hoarding behaviours).

The findings of this study reveal that the decline of cognitive level is accompanied by an increase in frequency of agitation. However, this correlation is curvilinear, that is, the correlation reaches a peak, after which as cognitive deterioration progresses there is a corresponding decline in frequency of agitation as well as a change in the type of agitated behaviour. In relation to verbal agitation, the researchers report that it is generally associated 'with early and middle stages of dementia'
(Cohen-Mansfield, Marx, & Rosenthal, 1990, p. 7). With the progress of dementia and the decline in cognitive level, subjects tend to exhibit aggressive and physically nonaggressive behaviours. However, in the latter stages of advanced dementia, because of the dependent nature of physical function on cognitive integrity, there is a reduction in the frequency of physically nonaggressive agitated behaviour. One example is pacing. In the terminal stage of dementia, because subjects are less likely to be able to ambulate, there is a significant decline in agitation in terms of aimless pacing.

Although Cooper, Mungas, and Weiler (1990) restricted their subjects \( n = 680 \) to only those dementia sufferers diagnosed with probable Alzheimer's disease, their finding also indicates that agitation is associated with cognitive decline. However, because of the low level of correlation between cognitive impairment and agitation, the researchers suggest that factors other than cognitive impairment may have equal or even more significance as predictors of agitation.

### 2.5 Predictors of agitation

#### 2.5.1 Predisposing factors

Although there is lack of information on the cause of agitation and the course it takes (Cohen-Mansfield, 1989), some predisposing factors for agitation have been identified, such as, "premorbid personality, deficits in cognitive functioning, and cerebral impairment" (Cohen-Mansfield & Billig, 1986, p. 713).

Anecdotal reports of a relationship between pre-morbid personality and agitation are supported by Ryden's (1986) study which found that about half of the subjects displaying agitation in terms of aggressive behaviour had a predisposing aggressive personality. Monsour and Robb (1982) suggest wandering, which is another
behaviour associated with agitation, is also linked with premorbid lifestyle. Their findings indicate that individuals who, prior to becoming demented, had engaged in high level of social and leisure activities tend to exhibit wandering behaviour. They also report that stress experienced before the onset of dementia has a bearing on agitation displayed by dementia sufferers. This link between agitation and premorbid stress is also supported by Cohen-Mansfield and Marx (1990).

Although, as discussed earlier, studies have indicated cognitive impairment as a major predictor of agitation it is important to understand factors underlying this linkage. Dementia is a broad term that includes many distinct types (Molloy & Lubinski, 1991) of which Alzheimer's disease accounts for 50 to 60% and multi-infarct dementia 20% of all known cases (Fraser, 1987). Dementia is a "neurobehavioural syndrome characterised by personality changes and widespread cognitive impairment" (Osimani & Freedman, 1991, p. 33). Mental activity is affected at least in three of the following areas: language, memory, visuospatial skills, emotions or personality, and cognition (Cummings & Benson, 1986). Impaired mental activity and accompanying memory loss underlie the communication impairment that is symptomatic of dementia (Gilleard, 1984; Kempler, 1991).

It is suggested that difficulty or inability to communicate their needs may also account for at least some of the agitation displayed by dementia sufferers (Norberg, 1990; Lubinski, 1991). It will be recalled that Cohen-Mansfield and Billig (1986) in their definition of agitation do not include behaviours as agitated if they may be "explained by needs or confusion per se" (p. 712). It is important to make this distinction because the perception of a behaviour as being a problem is influenced by "the understanding, flexibility, and supportiveness of caregivers" (Deutsch & Rovner, 1991, p. 341). In addition, an insensitive or
uninformed approach of a care-giver may stress patients beyond their mental capacities resulting in agitation (Deutsch & Rovner, 1991).

Other factors that may predispose a person to agitation may be confusion, depression, medications, and delusions (Robinson, Spencer, & White, 1989). The present study investigated if a more flexible approach towards patients in terms of providing freedom of choice influenced their level of agitation.

2.5.2 Precipitating factors.

The literature on dementia identifies a number of situations or conditions that may precipitate agitation. Some common precipitating factors suggested are: "lack of exercise, stimulation, and activity; fluctuations in neurologic functioning; fatigue" (Cohen-Mansfield & Billig, 1986, p. 712).

Anecdotal reports as well as some studies also indicate that agitation increases in some dementia sufferers around sunset. This phenomenon is described in the literature as 'sundown', 'sundowner', or 'sundowning syndrome'. Evans (1987) found that 11 out of 89 subjects (12.3%) demonstrated an increase in agitation in terms of restlessness and verbally agitated behaviour. Cohen-Mansfield, Marx, and Rosenthal (1989) reported that 14% of the 408 elderly subjects in their study manifested an increase in seven of the behaviours commonly seen both on the early and late shifts. However, it was also observed that 17% of the subjects exhibited an increase in the same behaviours on the early shift.

Although sundown syndrome is widely recognised there is still no clear understanding of this phenomenon (Cohen-Mansfield, Marx and Rosenthal, 1988). It has been suggested that as daylight fades, decreased visibility may contribute to an impaired perception of the environment.
Dementia sufferers may become more confused and subsequently manifest an increase in behavioural problems (Wolanin & Phillips, 1981). Hall and Buckwalter (1987) hypothesise that as the day progresses dementia sufferers are rendered less able to cope with stressors arising from external stimuli, that is, their threshold of tolerance of stress is progressively lowered. It is conceivable that by the end of the day dementia sufferers may be at a very low level of tolerance. This low tolerance, according to Hall and Buckwalter (1987) may explain why around sunset some dementia sufferers are more agitated and display an increase in behavioural problems.

2.6 Summary

To summarise, the term agitation is loosely used to describe a number of behaviours commonly seen in dementia sufferers. Findings indicate there is a relationship between cognitive impairment and agitation. Some information is also available as to what may predispose an individual to agitation. It is also known that certain factors or conditions may precipitate agitated behaviour. However, there is lack of knowledge as to what causes agitation.

2.7 Management of Agitation

Lack of earlier scientific interest (Cohen-Mansfield & Billig, 1986) as well as the complex nature of agitation in terms of methodology and theory limit our understanding of agitation, its treatment and prevention (Cohen-Mansfield, 1989). As a consequence, the management of agitation poses a major problem to care-givers (Struble & Sivertsen, 1987) and is one of the most stressful aspects of dementia care (Baumgarten, Becker, & Gauthier, 1990). Inability to carry this burden
any longer often precipitates institutionalisation (Sanford, 1975; Silver & Yudofsky, 1987).

Several studies have investigated current strategies to manage agitation. A survey by Zimmer, Watson and Treat (1984) reports that in skilled nursing facilities in New York State pharmacologic intervention was most widely used affecting 58% of patients. Other alternative treatments of choice were physical restraints, Reality Orientation and psychiatric consultations. Among nursing home patients, however, the use of explanation (30%), tender loving care (TLC; 21%), ignoring (18%), diversion (15%), getting help (9%) and restraints (8%) were principle strategies employed to manage so-called 'difficult' patients (Hoffman, 1987). In relation to management of agitation among cognitively impaired patients, Struble and Sivertsen (1987) found that both medication and physical restraint were jointly used in managing 57% of agitated behaviours, while 39% were controlled with the use of medication alone, and 4% through physical restraint.

2.7.1 Pharmacologic intervention

Pharmacologic intervention for the management of agitation predominates the literature (Cohen-Mansfield & Billig, 1986; Petrie, 1983;). Although documented evidence confirms that psychotropic drugs, prescribed to control agitation, tend to produce undesirable adverse side effects (Kikuta, 1991), studies indicate that drugs are widely used to manage agitation in the elderly (Struble & Sivertsen, 1987). Paradoxically, these drugs may at times even aggravate the agitation (Cohen-Mansfield, 1989). It is also suggested that the effect of drugs may be over-evaluated. In their study, Lustig, Osterweil and Berci (1987) discontinued the use of drugs (haloperidol and alprazolam) and found no increase in agitated behaviours over the 2-week trial period.
With such potential risks, it is of concern that there is lack of a systematic evaluation of the relative effectiveness of the various drugs used to control agitated behaviour (Cohen-Mansfield, 1989; Patel & Hope, 1992; Risse & Barnes, 1986).

2.7.2 Physical Restraints

Physical restraint is an age-old practice used to contain mentally ill individuals (Brower, 1991). It is still a common strategy to manage some of the behavioural problems (Brower, 1991; Strumpf & Evans, 1991) listed in the Cohen-Mansfield Agitation Inventory as behaviours associated with agitation. Several studies have underscored nursing concern and dilemma over the extensive use of physical restraint (Scherer, Janelli, Kanski, Neary & Morth, 1991; Varone, Tappen, Dixon-Antonio, Gonzales & GLussman, 1992). Some studies have focused on legal implications (Stabler-Hass & McHugh, 1992) and ethical issues (Strumpf & Evans, 1991) in relation to the use of physical restraint to manage problems associated with agitation. Although some alternative strategies have been proposed (Brower, 1991), studies indicate poor nursing awareness of these interventions (Stilwell, 1991). It is also essential that these alternative strategies are empirically tested and validated as effective interventions for managing agitation in dementia sufferers.

2.7.3 Interpersonal Interaction

This approach to manage agitation is behaviour-oriented and is based on an improved awareness of dementia and the special needs of dementia sufferers. Some of the more common strategies are: specific communication techniques, problem solving method, Reality Orientation, Reminiscence therapy, and Validation therapy.
Staff are encouraged to adopt communication techniques appropriate for interacting with dementia sufferers, such as, not to accost a patient from behind, to limit a choice between two items at a time, to avoid open-ended questions or invitations, to avoid patronising or infantilising attitude or verbalisation (Gwyther, 1985; Mace & Rabins, 1981; Robinson, Spencer, & White, 1989). According to Zarit, Zarit and Rosenberg-Thompson (1990), anecdotal evidence suggests appropriate interpersonal interaction has been effective in controlling agitation among residents in a Special Treatment Unit for Alzheimer's Disease.

An important strategy in the management of agitation is a behavioural analysis approach termed "problem solving" (D'Zurilla & Goldfried, 1971; Goldstein & Davison, 1976). It involves the following steps: (a) monitoring unacceptable behaviours, such as agitated behaviours, disruptive behaviours, or problem behaviours in order to determine possible antecedents and consequences, (b) developing possible solutions, (c) selecting a solution, (d) rehearsing solution, and (e) evaluating outcome (Zarit, Zarit, & Rosenberg-Thompson, 1990). Some of the treatment modalities in behavioural analysis approach are extinction, timeout, correction, and reinforcement (Hussian & Davis, 1985). Studies indicate good outcome with the use of positive reinforcement in managing agitated behaviours, such as in reducing screaming (Davis, 1983), and in controlling aggression (Vaccaro, 1988). However, some of these interventions are not practical for nursing as they involve increased contact time and consequently, higher staff/client ratio. In addition, ethical implications also need to be considered in the choice of these treatments (Cohen-Mansfield, 1989).

Reality Orientation is a therapy designed to enhance the quality of life of confused elderly people by helping them to regain awareness of their environment (Taulbee & Folsom, 1966). The aim is to improve
mental and behavioural functioning by developing a humanitarian interpersonal approach towards dementia sufferers and establishing a prosthetic environment (Griffiths, 1991). To set up a supportive milieu, staff are instructed in every interaction with patients to endeavour to keep them in touch with reality in terms of time, place, and person. Orienting aids are to be displayed to reduce confusion. Formal group therapies are also encouraged (Holden & Woods, 1982).

Several studies have questioned the value and effectiveness of Reality Orientation (Teasdale, 1983). Although there is some evidence to indicate reality orientation contributes towards orientation of patients, little evidence is available to suggest a positive impact on patients' behaviour (Burton, 1982; Powell-Proctor & Miller, 1982).

King (1982) describes reminiscence as "memory that has been filtered through time and altered by the individual's other life experiences" (p. 22). The focus is on providing opportunities to stimulate recall of an individual's past, "either verbally or internally" (King, 1982, p. 21). Some therapists (Lewis & Butler, 1974; Pincus, 1970) use reminiscence as a diagnostic tool for psychotherapy to resolve underlying psychological conflicts. Reminiscence therapy is used by other therapists (Ebersole, 1976b) to enhance socialisation among elderly people. Reminders of the past, such as music, photographs, and souvenirs, provide a topic for conversation and help in reducing isolation. Case studies by Hala (1975) indicate reminiscence tends to bring about verbal and nonverbal behavioural changes in nursing home residents. One important aspect of reminiscence therapy is that by initiating social conversation, it reduces sensory deficit and in turn boredom, which is often linked with agitation. Anecdotal reports reveal that nurses, whether advertently or inadvertently, often employ the principles of reminiscence therapy when they initiate conversations with
elderly patients. However, because of memory deficits, impaired communication, and poor concentration in severe dementia sufferers, this approach may not always be practical with these individuals.

In 1963, Feil formulated Validation therapy and later promulgated its use in her publications (1982). The therapy comprises three components: (a) classification of behaviours into the four stages of malorientation, time confusion, repetitive motion, and quiescence; (b) communication techniques suggested for each stage; and (c) a theory pertaining to elderly people who experience disorientation in their late seventies and above (Jones, 1987). The underlying philosophy is that by demonstrating love and validating, that is, understanding and accepting, the feelings of confused elderly people, the therapist will gently lead them to current reality.

Although Validation therapy has wide support, Goudie and Stokes (1989), are of the opinion that it is founded on an "unwise and unsound theory" (p. 36). They argue, first, that Validation therapy "deflects staff from the probable underlying content and feelings which are masked by the confused message" (p. 36). Second, Validation therapy attributes to dementia sufferers "intellectual and analytical powers" which they do not have because of the nature of the disease (Goudie & Stokes, 1989, p. 36).

2.7.4 Environmental Manipulation.

The provision of a therapeutic environment is advocated in the literature as an important strategy in managing agitation in dementia sufferers (Andreason, 1985; Hayter, 1983; Peppard, 1985; Ryden, 1986). This support stems from the theory that the environment affects the individual, and the individual affects the environment (Kahana, 1974; Lazarus, 1978; Lawton, 1983; Moos, 1976; Parr, 1980).
The environment is comprised of the physical setting, the individual, and how the individual interacts with others (Lubinski, 1990). According to Lewin (1951), the individual constantly seeks to control the environment. The behaviours and subsequent well-being of an individual are dependent upon how well the individual is able to control the environment to make it fit or be congruent with the individual (Kahana, 1974). A person is considered as having internal locus of control if the individual perceives he or she has control over the environment. The perception of not having control over the environment is described as external locus of control (Rotter, 1966). Studies indicate that good self-esteem and satisfaction with life are associated with internal locus of control (Fawcett, Stonner, & Zepelin, 1980). Individuals with an external locus of control have been shown to have low self-esteem (Maccoby, 1980), reduced satisfaction with life (Thomas, 1988), greater depression (Hunter, Linn, Harris, & Pratt, 1981), manifest poor health status and take more medication (Wood & Strong, 1987).

Freedom of choice in terms of deciding when, where, and how an individual conducts a behavioural activity is considered an inalienable right of human life. Loss or threat to this basic right tends to trigger in an individual a reaction ranging from being upset to an actual attempt to regain or defend this right. The intensity of this reactive behaviour, termed 'reactance', is closely related to the perceived magnitude of loss of right and the social power of the perpetrator (Brehm, 1966).

Institutionalisation involves rules and regulations that often impinge on an individual's freedom of choice, resulting in loss of control. According to Wolanin and Phillips (1981) and Burnside (1980), loss of control leads to attempts at regaining control by displaying agitated behaviours, such as frequent demands or non-compliance with instructions. Hamel and associates (1990) found that being told to do
something was the most common situation that elicited aggressive behaviours in patients. Meddaugh (1990) used the reactance theory to investigate verbal and physical aggressive behaviours in 27 cognitively impaired elderly residents of 3 skilled nursing facilities. Two groups were involved in the observational qualitative study: (a) aggressive subjects and (b) nonaggressive subjects. Findings indicate that subjects who had previously led a more active life were more likely to be aggressive in institutional care. It is suggested that because these individuals experience greater loss of freedom of choice, they tend to demonstrate a stronger reactance in terms of agitation. Paradoxically, as a consequence of their agitation, staff are less disposed to offer them choices. In contrast, non-aggressive subjects are likely to be offered more choices.

There is a modicum of published nursing research on environmental manipulation as a strategy to manage agitation in dementia sufferers (Hall & Buckwalter, 1987; Kayser-Jones, 1992; Kolanowski, 1992). Hall and Buckwalter's (1987) conceptual model, the Progressively Lowered Stress Threshold, suggests that institutionalised dementia sufferers are routinely subjected to a host of environmental stimuli, which are classed as extrapersonal stressors (Neuman, 1989). Inability to cope with these stressors leads to a buildup of stress. Tolerance of stress is also progressively lowered during the day. As a consequence, incidents of agitated behaviour increase as the day progresses. Hall and Buckwalter (1987) report that some healthcare facilities have applied their conceptual model and have introduced structured rest periods during the day to reduce the level of stress among dementia sufferers. Initial anecdotal notes indicate a reduction in agitated behaviour among dementia sufferers. It is also reported that the effects of sundowning syndrome have been minimised and even the
quality and quantity of sleep have improved as the result of reduced night awakenings.

Another strategy for environmental manipulation focuses on the design of the physical setting as well as activity programmes for dementia sufferers. Over the last decade special care units for accommodating dementia sufferers have been established. These units incorporate structural designs to meet the needs of dementia sufferers. Elaborate consideration has been given to include 'natural phenomena, manmade objects, space utilization, and sensory characteristics such as visual, auditory, olfactory, and tactile information' (Lubinski, 1991, p. 258). In addition, these special care units have introduced a high patient-staff ratio, as well as activity programmes designed to address the cognitive and functional deficits of the residents (Holmes, Teresi, Weiner, Monaco, Ronch, & Vickers, 1990). However, there is lack of empirical validation for most of these special care units in terms of managing behaviours associated with agitation (Kromm & Kromm, 1985; Peppard, 1985; Hall & Buckwalter, 1987). A recent longitudinal study by Holmes and associates (1990) found that the living environment of 199 demented subjects, 49 in special care units and 150 in traditional healthcare facilities had no significant effect, either beneficial or deleterious.

2.8 Summary

Lack of a proper understanding of the cause of agitation places limitations on developing effective strategies to manage agitation. Although physical and chemical restraints are widely used, studies indicate these interventions are not only inappropriate but also unsatisfactory and often ineffective in controlling agitation. While interpersonal interaction is a useful strategy, few interventions have been
empirically tested, and most of them are not suitable for nursing because they are time-consuming and require a high staff-patient ratio. Although environmental manipulation in terms of providing therapeutic designs for dementia sufferers is currently widely received, its effectiveness in managing agitation has not been proven. The present study investigates environmental manipulation from another perspective. It looks at the effect of freedom of choice on agitation in dementia sufferers in a nursing home setting.

2.9 Sleep Pattern Disturbance

2.9.1 Sleep in the elderly.

Sleep physiology and sleep disorders have been mainly studied in sleep laboratory studies employing small samples and polysomnographic equipments (Cohen-Mansfield, Waldhorn, Werner, & Billig, 1990, p. 512). Findings indicate that sleep in the elderly is characterised by more frequent nocturnal awakenings and longer wake periods as compared with young adults (Feinberg, Koresko & Heller, 1967; Feinberg, 1974; Hoch, Reynolds III, & Houck, 1988; Kahn & Fisher, 1969; Kales, Wilson, & Kales, 1967; Prinz, 1977). These findings are also supported by other studies that employ such methods as the use of questionnaires and sleep charts (Hayter, 1983; McGhie & Russell, 1962; ). However, despite the common agreement on these aspects of sleep, Kedas, Lux, and Amodeo (1989), in reviewing the literature on sleep research, caution that there are some conflicting reports on sleep in the elderly. One important issue is the amount of sleep the elderly need. Although the elderly tend to have an overall reduction in sleep hours consisting of six to seven hours per day (Goldman & Rockstein, 1975), there is an increase in daytime napping, totalling 7 minutes for healthy elderly individuals and 79 minutes for elderly dementia sufferers (Prinz, 1982).
Hoch, Reynolds III, and Houck (1988) argue that the reduction of nocturnal sleep hours and the increase in daytime napping support the view that the need for sleep is not reduced, instead sleep is spread over the 24-hour period.

2.9.2 Sleep in institutionalised dementia sufferers.

Much of the information on sleep in the demented is from laboratory studies and most of it relates to mainly nocturnal sleep pattern (Regestein & Morris, 1987). Furthermore, "because of irregularities of electroencephalogram (EEG) patterns in this population" (Cohen-Mansfield, Waldhorn, Werner, & Billig, 1990, p. 512) the usefulness of laboratory studies for assessing sleep in dementia sufferers remains limited.

In the early stages of dementia, only multi-infarct dementia sufferers exhibit a more fragmented sleep pattern than normal elderly individuals (Aharon-Peretz et al., 1991). However, in advanced dementia, as generally found in an institutional setting, there is no significant difference between the sleep patterns of the demented, regardless of the underlying cause of dementia (Allen, Walter, Stahelin, & Spiegel, 1987). Compared with the sleep pattern of normal elderly people, institutionalised dementia sufferers exhibit more frequent nocturnal awakenings, longer wake periods, and an increase in daytime napping (Aharon-Peretz et al., 1991; Feinberg, Koresko, & Heller, 1967; Hoch, Reynolds III, & Houck, 1988; Prinz, 1982).

2.10 Interventions

Difficulty in achieving and maintaining sleep is common among dementia sufferers. Anecdotal observations indicate that this poses a major problem for nurses. There is concern among some nurses that lack
of uninterrupted sleep is deleterious to their patients' well-being, although there is no empirical evidence to support this view. As a consequence, some nurses seek pharmaceutical intervention for their patients. Conversely, many nurses recognise that drugs do not provide natural sleep and may even have undesirable adverse effects. They therefore, seek other alternatives to manage their patients' sleep problem.

There are a number of suggestions relating to sleep hygiene, such as maintaining regular sleep schedules, providing a conducive sleep environment, facilitating individual sleep rituals, and offering specific drinks that promote sleep (Muncy, 1986). Some authors recommend discouraging daytime napping to improve night sleep (Schirmer, 1983), while the study by Regestein and Morris (1987) reveals that daytime sleep does not reduce night sleep in institutionalised elderly dementia sufferers. However, no empirically tested nursing intervention for managing sleep problem in dementia sufferers is currently available. This study, therefore, investigates if providing freedom of choice will reduce agitation in dementia sufferers and in turn promote sleep in these individuals.

2.11 Conclusion

A search of the literature has demonstrated that there is a lack of empirical evidence to support the effectiveness of nursing strategies to manage agitated behaviour and sleep problem in dementia sufferers. The present study has, therefore, compared and evaluated the effect of 'environmental' manipulation on agitation in dementia sufferers residing in a nursing home. It has also investigated its effect on sleep in these individuals.
2.12 Theoretical Framework

The current study adopted the theoretical framework chosen by Vogel and Mercier (1991) when examining the effect of institutionalisation on nursing home populations. This conceptual model is based on Lewin's (1951) theoretical work. Lewin hypothesises that the behaviour and subsequent well-being of an individual are dependent upon how well the individual and his or her environment fit each other. It is suggested that the individual is constantly seeking to adapt the environment to achieve this fit or congruence. Failure to attain this fit may have a bearing on the well-being of the individual.

In the past few decades there has been increasing support for this theory that the environment affects the individual and the individual affects the environment (Kahana, 1974; Lazarus, 1978; Lawton, 1983; Moos, 1976; Parr, 1980). However, it is important to understand that the environment is comprised of the physical setting, the individual and how the individual relates with others (Lubinski, 1990). Relocation through placement in an institution brings about a change of environment which involves not only a new physical setting but possibly a new social environment that may not fit the individual's "personal lifelong characteristics" (Lubinski, 1990, p. 259).

One important characteristic of this change in environment is constraints placed on residents. Institutions often have specific time schedules that residents have to adhere to, such as, time for going to bed and arising in the morning, meal-time, and shower time. Lack of flexibility in time schedules may affect the residents and create stress through loss of control over their environment. This would then affect the person-environment congruence and consequently compromise their well-being. Studies indicate that inability, whether real or perceived, to control the environment may result in low self-esteem (Maccoby, 1980),
reduced satisfaction with life (Thomas, 1988), depression (Hunter et al.),
il-health and increased use of medication (Wood & Strong, 1987). It is
suggested that loss of control over the environment may result in agitated
(Burnside, 1980; Wolanin & Phillips, 1981) or aggressive behaviours
(Hamel et al.).

Lack of control over the environment in terms of institutional
constraints may have an even greater impact on on dementia sufferers.
Cognitive impairment and memory loss render these individuals less
competent to cope with the loss of freedom of choice to determine their
behavioural activities associated with daily living (Lawton, 1980).
Agitated behaviours manifested by dementia sufferers may be to some
extent linked with this loss of control over the environment. In addition
institutional sleep schedules may also have a bearing on sleep problems
in these individuals.

The current study tested this theory of person-environment
congruence. It investigated if providing dementia sufferers freedom of
choice in relation to when, how, and where activities of daily living were
performed affected the well-being of these individuals in terms of
agitation and 24-hour sleep.
Figure 1. Conceptual model: person-environment congruence
(Lewin, 1951)
(Designed specifically for the study by the researcher)
3.1 Research Design

The study used a longitudinal time design consisting of four phases each covering a period of 4 weeks. Data were collected at the end of each phase. The intervention 'environmental manipulation' was implemented following the second phase, resulting in two pre-test and two post-test findings (Table 1). To minimise such extraneous variables as age, gender, physical and mental state, ethnicity, and medication confounding the findings, a subject as own control or "within-subject" design was selected. There were no experimental and control groups.

The independent variable was environmental manipulation: Facilitating freedom of choice as to when, where and how dementia sufferers conduct various activities of daily living such as going to bed, arising in the morning, eating, and attending to hygiene.

There were two dependent variables. One was agitation: manifested as agitated behaviours listed in the Cohen-Mansfield Agitation Inventory (CMAI) (Appendix B).

The other was 24-Hour Sleep: This refers to sleep over a 24-hour period, which comprises 'sleep by day' (sleep during the early and late shifts), and 'sleep by night' (sleep during the night shift) as rated on the sleep scale which forms part of the Dementia Mood Assessment Scale (Sunderland & associates, 1988).
**Table 1**

**Longitudinal Time Design**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Duration</th>
<th>Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Pre-test-1</td>
<td>28 days</td>
<td>Data collected</td>
</tr>
<tr>
<td>(2) Pre-test-1</td>
<td>28 days</td>
<td>Data collected</td>
</tr>
<tr>
<td>(3) Post-test-1</td>
<td>28 days</td>
<td>Data collected</td>
</tr>
<tr>
<td>(4) Post-test-2</td>
<td>28 days</td>
<td>Data collected</td>
</tr>
</tbody>
</table>

**INTERVENTION**

'Environmental Manipulation'
3.2 Setting

The study was conducted in a 120-bed outer metropolitan nursing home. One of the wards with a 44-bed capacity was allocated to the care of dementia sufferers. Provision of space was limited. Most of the residents shared sleeping accommodation and one multi-purpose living area served as lounge, dining, and activities area.

Nursing staff included registered general nurses, enrolled nurses, and nursing assistants. Both trained and untrained nurses are called in to meet any staff shortage. To facilitate sharing of physical workload the ward has two arbitrary sections with approximately equal number of patients who require full nursing care. On an early shift (7:00am-3:30pm), 4 nurses, one of whom is registered, are allocated to each section. The late shift (1:00pm-9:30pm) has 3 full-time nurses, including a registered nurse. Two part-time nurses assist the late shift nurses between 5:00pm and 9:00pm. The night shift (9:00pm-7:30am) is staffed by a registered nurse and an enrolled nurse.

3.3 Subjects

To be included in the study, subjects had to be (a) dementia sufferers and (b) elderly, that is, 65 years and over. Of a total of 42 residents 2 were excluded from the study because they were 50 and 56 years of age and did not meet the age criterion. Six died during the study period and one was discharged from the ward, resulting in 33 participants in the study. They were all dementia sufferers, with cognitive status ranging from 3.5 to 6.75 on the Brief Cognitive Rating Scale (M = 6.06; SD = 0.84). Twelve participants were male and 21 female. Their age range was 67-98 years (M = 84; SD = 7.83). Most of the subjects had
received only a basic education, that is, primary education. The subjects presented varying degrees of physical disabilities commonly associated with elderly individuals. Sixteen of them were ambulant. Only four participants were on regular sleep inducing medication, and two others used such medication on occasions. The sociodemographic and other characteristics of the subjects are presented in Table 2.

Table 2

Sociodemographic and Other Characteristics of Subjects

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects</td>
<td>12</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td>Age range in years</td>
<td>67-96</td>
<td>73-98</td>
<td>67-98</td>
</tr>
<tr>
<td>Mean age</td>
<td>81.75</td>
<td>86.76</td>
<td>84.25</td>
</tr>
<tr>
<td>Mobility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulant</td>
<td>5</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Non-ambulant</td>
<td>7</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>7</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Married</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Single</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>10</td>
<td>19</td>
<td>29</td>
</tr>
<tr>
<td>Secondary</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Mean cognitive rating</td>
<td>6.2</td>
<td>6</td>
<td>6.1</td>
</tr>
<tr>
<td>Sleep medication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular use</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Occasional use</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
3.4 **Instruments**

Four instruments were used to collect data for the study: a demographic information sheet (Appendix A), the Cohen-Mansfield Agitation Inventory (CMAI) (Appendix B), Sleep Scale (Appendix C), and a modified version of the Brief Cognitive Rating Scale (Appendix D).

3.4.1 **Demographic information sheet.**

The demographic information sheet addresses subject characteristics: gender, age, marital status, education, medical diagnosis of type of dementia, cognitive status (based on the Brief Cognitive Rating Scale), and use of sleep medication.

3.4.2 **Cohen-Mansfield Agitation Inventory (CMAI).**

The CMAI (Cohen-Mansfield & Billig, 1986) uses the following 7-point rating scale to monitor 29 agitated behaviours: 1, never; 2, less than once a week; 3, one or two times a week; 4, several times a week; 5, once or twice a day; 6, several times a day; and 7, a few times an hour. The 29 behaviours listed in the CMAI were compiled by the researchers following input from nurses and a thorough search of the literature for behaviours identified as being associated with agitation. Inter-rater reliability coefficients calculated in the study by Cohen-Mansfield et al (1989) for each behaviour among three sets of raters were .92 (n = 16), .92 (n = 23), and .88 (n = 31). The CMAI has been extensively used since 1986 in on-going studies on agitation (Cohen-Mansfield, Marx, & Rosenthal, 1990; Marx, Cohen-Mansfield, & Werner, 1990; Cohen-Mansfield, Werner, & Marx, 1989).
3.4.3 **Sleep scale.**

The sleep scale is part of the Dementia Mood Assessment Scale (DMAS) developed by Sunderland et al (1988). The DMAS is built on the Hamilton Rating Scale for Depression (Hamilton, 1960) and is specifically aimed at assessing dementia sufferers. The DMAS forms part of the Psychogeriatric Nursing Assessment Protocol: Rating Forms developed by Abraham (1989). The sleep scale of the DMAS consists of two components: (a) sleep during night and (b) daytime sleep. Night sleep refers to sleep as observed on the night shift, and daytime sleep includes sleep observations from the early and late shifts. The sleep scale uses a 7-point rating scale from 0 to 6 inclusive. Absence of insomnia or uninterrupted 6-8 hours of sleep nightly rates a score of '0'. Almost nightly insomnia rates '6'. Alertness or absence of daytime napping scores a '0', while continuous drowsiness rates '6'.

3.4.4 **Brief Cognitive Rating Scale (BCRS).**

The Brief Cognitive Rating Scale (Reisberg, Schneck, Ferris, Schwartz, & de Leon, 1983) contains five axes of cognitive functioning: concentration, recent memory, past memory, orientation, and cognitive functioning. A modified version which comprises the first 4 axes was used in the study. Each axis uses a 7-point rating scale, with '1' indicating cognitive intactness and '7' severe cognitive decline. Pearson correlations of the BCRS axes with other psychometric and cognitive status questionnaire assessment tools were statistically significant and rated between .51 to .84 (Resisberg, Ferris, de Leon, & Crook, 1985). Interrater reliability ranged between .76 to .82 (Cohen-Mansfield, Marx, & Rosenthal, 1990).
3.5 Intervention

The Director of Nursing at the nursing home where the study was conducted had decided to change from a task-oriented care module to a client-oriented care module.

3.5.1 Task-oriented care module.

The task-oriented care module has been traditionally associated with nursing, where nurses were assigned their workload for each shift which consisted of the care of an allocated number of patients. They attended to their patients' hygiene, meals, wound care, bedmaking, nursing documentation and devoted any spare time to tidying the ward. Nurses were expected to adhere to ward routines which generally specified details such as which nurse performed a particular task at a scheduled time and what activities patients conducted at set times.

In the task-oriented care module, the focus is on meeting institutional time schedules such as mealtime, toileting time, ward activity time, and bedtime. Accordingly, whether awake or asleep, willing or unwilling, patients have to be out of bed, showered and ready for breakfast. Everyone has to have their main meals at scheduled times. Patients are toileted at set times. Attendance at ward activity programmes is not optional. In the evening, patients are expected to be in bed before the night staff came on duty.

3.5.2 Client-oriented care module.

This nursing approach prioritises the needs and wishes of the patients. Nurses learn to recognise that patients may indicate their wishes either verbally or non-verbally. Although nurses are still allocated a specific number of patients to care for, they are encouraged to comply as
far as possible with the wishes of their patients as to when, where, and how their patients conduct their activities of daily living. In the morning patients remain in bed until they are awake and indicate readiness to get out of bed. In the case of severely demented individuals, nurses get them out of bed if they are awake and are co-operative. If any resistance is encountered, nurses allow the patient to settle and return later when cooperation is indicated. Although breakfast is served at scheduled time, breakfast is set aside for those who are absent. The same flexibility is shown with other meals of the day. While ward activity programmes are conducted at set times, patients are encouraged and not coerced to attend these activities. Nurses suggest other diversional activities for those unwilling to attend ward activity programmes. In the evening patients retire to bed when they are ready to sleep.

3.6 Implementation of new care module

Staff were informed by the Director of Nursing of the proposed change in care module 2 months prior to its introduction. To facilitate implementation of the new care module, the following procedure was adopted by the Director of Nursing. Consultative meetings were held by the Director of Nursing with all staff including staff in the hotel and catering services. On-going discussions were held between the Director of Nursing and senior nursing staff to assess possible outcomes. Staff were encouraged by the Director of Nursing to express their views as to whether they wanted such a change. According to the Director of Nursing, staff were enthusiastic over the proposed change in care module. Furthermore, staff were given the option of transferring out of the dementia ward. Several nurses from other wards who wished to work in the dementia ward were granted permission to switch wards by the Director of Nursing.
To facilitate the change, educational opportunities were made available to all staff by the Director of Nursing. Literature, journal articles, and books on dementia care were placed in the nursing station. A full day workshop on dementia care was organised by the Director of Nursing for staff of the dementia ward. Several speakers addressed important issues in the care of dementia sufferers, such as understanding dementia, use of appropriate communication techniques, and management of agitation and sleep disturbance. The researcher explained the concept of freedom of choice and how the intervention 'environmental manipulation' in terms of providing freedom of choice would be implemented in the dementia ward. Brief educational sessions on other aspects of dementia care were also provided to staff by the Director of Nursing in the weeks preceding the implementation of the intervention.

3.7 Procedure

Information pertaining to subject characteristics: gender, age, marital status, education, and medical diagnosis of type of dementia was collected from the case history notes of the residents by a registered nurse. The charge nurse of the ward verified data were accurately transcribed by the registered nurse. On the early shift a senior nurse who was familiar with the residents administered the Brief Cognitive Rating Scale.

To provide a measurement of agitation and sleep across a 24-hour period, the CMAI and the DMAS (for sleep) were administered by 4 nurses who were familiar with the residents (i.e., nurses who had cared for the residents for at least 4 weeks). These nurses were selected by the Director of Nursing, two nurses from the early shift (7.00 am-3:30 pm), and one nurse each from the evening (1.00 pm-9:30 pm), and night (9.00pm-7:30 am) shifts. The choice of 2 nurses from the early shift was
necessitated because on this shift the two sections of the ward were each staffed by 4 nurses, who provided nursing care to residents in their own areas. One nurse was in charge of each section. However, because the evening and night shifts were staffed by 5 and 2 nurses respectively, the charge nurse on these shifts therefore, had direct contact with all residents.

Prior to commencement of the study, the researcher met the four nurses and the Director of Nursing in order to explain and clarify the use of the CMAI and Sleep scales. The researcher was also available for ongoing contact to answer queries on administering the instruments.

Rating of each subject in relation to agitation and sleep pattern was performed at four stages, with 28 days separating each stage. Rating reflected behavioural observations for the preceding 14 days, that is, the rating was carried out retrospectively.

The third rating took place 4 weeks (28 days) after the introduction of 'environmental' manipulation. The final rating followed 28 days after the third rating.

3.8 Ethical Considerations

Consent for the study was first obtained from the Ethical Review Committee of Edith Cowan University. (Appendix E).

A formal letter was then posted to the Director of Nursing requesting permission to undertake the study at the nursing home. The letter explained the purpose of the study and the nature of nursing staff involvement in collecting data. (Appendix F). Permission was granted by the Director of Nursing.

The transition from a task-oriented to a client-oriented care module, that is, the introduction of environmental manipulation, was an administrative decision of the nursing home. Monitoring and recording of
agitation and sleep pattern are routine nursing practice and were carried out by nurses. None of the measures were invasive. The role of the researcher was to act as resource person when nurses administered the instruments. The use of a code system ensured confidentiality of data.

Because of participants' poor cognitive functional level, it was felt not to be appropriate to seek their agreement to take part in the study. Instead, the next of kin of the participants were formally contacted by mail. The letter explained to them the purpose of the study, the freedom to participate in the study or to withdraw at anytime with no repercussion, and it assured them of confidentiality (Appendix G).

To be included in the study, the next of kin of each subject was required to sign a consent form. (Appendix H).
CHAPTER FOUR

Results

Environmental manipulation as an intervention was evaluated in terms of change over a period of 16 weeks in (a) agitation level and (b) 24-hour sleep in 33 institutionalised elderly dementia sufferers. Four time periods comprising two pre-intervention (pre-1 and pre-2) and two post-intervention stages (post-1 and post-2) provided data on agitation and sleep.

4.1 Agitation Level

Agitation level was examined under four categories: aggressive behaviours, non-aggressive physically agitated behaviours, verbally agitated behaviours, and 'other agitated' behaviours. The mean scores for frequency ratings (on the CMAI scale) of individual behaviours under these categories were subjected to repeated measures analyses of variance (ANOVA) to evaluate changes over time between the pre and post intervention level of agitation. Because of the large number of statistical tests performed on the data the more conservative significance level of .01 was set rather than the .05 level.

4.1.1 Aggressive behaviours.

Three different time periods - early shift, late shift, and night shift - were examined.

On the early shift there was no clear evidence to suggest any change in participants' aggressive behaviours. Overall ANOVA findings were: $F(3,96) = 2.99, p > .01$. Although following the intervention aggressive behaviours were lower, the differences were not significant. (see Figure 2)
Figure 2. Effect on aggressive behaviours on the early shift

For the late shift there was no significant difference observed between pre and post intervention: $F(3,96) = 3.82, p > .01$. (Figure 3)

Figure 3. Effect on aggressive behaviours on the late shift

43
On the night shift, there was no evidence of any statistically significant change resulting from the intervention: $F(3,96) = 1.02, p > .01$. (Figure 4)

**Figure 4.** Effect on aggressive behaviours on the night shift

### 4.1.2 Non-aggressive physical agitation

Findings indicate no significant change over time in non-aggressive physical agitation on the early shift: $F(3,96) = 0.75, p > .01$. (Figure 5)
On the late shift, no significant change over time was evident: $F(3,96) = 2.48, p > .01$. (Figure 6)

Figure 6. Effect on non-aggressive behaviours on the late shift

Findings on the night shift show no overall significant change over time: $F(3,96) = 0.47, p > .01$. (Figure 7)

Figure 7. Effect on non-aggressive physical agitation on the night shift
4.1.3 Verbal agitation

On the early shift, a significant difference was found amongst the 4 time periods: $F(3,96) = 7.82$, $p < .01$. Although no significant effect was observed between the pre-intervention phases and Post-1: Pre-1 vs Post-1, $F(1,32) = 1.23$, $p > .01$; Pre-2 vs Post-1, $F(1,32) = 1.96$, $p > .01$, participants' mean verbal agitation scores were lower at Post-2 compared to Post-1: $F(1,32) = 11.03$, $p < .01$, indicating that over time participants' verbal agitation was significantly reduced. (Figure 8)

![Figure 8. Effect on verbal agitation on the early shift](image)

On the late shift, an overall significant difference was found amongst the four data collecting periods: $F(3,96) = 5.10$, $p < .01$. A significant change was found between Pre-1 and Post-1: $F(1,32) = 8.10$, $p < .01$. However, there was no significant difference between Pre-2 and Post-1: $F(1,32) = 0.17$, $p > .01$. There was also no significant change between Post-1 and Post-2: $F(1,32) = 0.61$, $p > .01$. (Figure 9). Examination of the graph indicates that participants' verbal agitation increased significantly following the first data collecting stage: Pre-1 and Pre-2: $F(1,32) = 3.41$, $p < .01$. 

46
Figure 9. Effect on verbal agitation on the late shift

On the night, shift, no significant difference was found in participants' mean verbal agitation scores: $F(3,96) = 3.41, p > .01$. (Figure 10)

Figure 10. Effect on verbal agitation on the night shift
4.1.4 Other agitated behaviours

A significant difference was found amongst the four time periods for the early shift: $F(3,96) = 5.03, p < .01$. No significant differences were found between Pre-1 and Post-1: $F(1,32) = 3.45, p = > .01$; and between Pre-2 and Post-1: $F(1,32) = 1.24, p = > .01$. However, a significant difference was found between Post-1 and Post-2: $F(1,32) = 7.96, p = < .01$. Comparison of participants' mean scores indicates that 'other agitated' behaviours increased following Post-1. (Figure 11).

![Graph showing mean scores over time]

Figure 11. Effect on other agitated behaviours on the early shift

No significant results were obtained for the late shift: $F(3,96) = 3.04, p > .01$. (see Figure 12)

ANOVA results for the night shift also indicate non-significant results: $F(3,96) = 1.60, p > .01$. (see Figure 13)
Figure 12. Effect on other agitated behaviours on the late shift

Figure 13. Effect on other agitated behaviours on the night shift

To summarise, on the early shift, participants' verbal agitation was significantly reduced following the intervention of 'environmental manipulation' while 'other agitated' behaviours became significantly worse. On the late shift, 'verbal agitation' rose significantly prior to the intervention and did not change following the intervention. No significant change was observed on the night shift for any of the 4 dimensions of agitation.
4.2 Descriptive analysis of agitation

4.2.1 Effect of intervention on agitation.

Using descriptive statistics, the total number of agitated behaviours, that is, those behaviours occurring at least once week - rating a score of 3 and above, was examined for each of the three nursing shifts across the four time periods: Pre-1, Pre-2, Post-1, & Post-2. (Figure 14). Cohen-Mansfield and associates (1989) suggest that scores lower than 3 indicate mild manifestation of agitation, and clinically may not be so important.

Although the total number of agitated behaviours on the early shift over the 4 time periods (M = 5.55, 5.94, 5.09, & 4.61) showed a downward trend following the intervention, results of a repeated measures analysis indicated no overall significant change: \( F(3,96) = 2.38, p > .01. \)

The late shift, in contrast, indicated an upward trend throughout the study period (M = 3.48, 4.70, 5.03, & 5.64). Overall ANOVA results were significant: \( F(3,96) = 5.1, p < .01. \) A significant change was found between Pre-1 and Post-1: \( F(1,32) = 7.64, p < .01. \) Examination of the graph indicated a significant increase in agitated behaviours between these two phases. However, there was no significant change between Pre-2 and Post-1: \( F(1,32) = .37, p > .01 \) and between Post-1 and Post-2: \( F(1,32) = .95, p > .01. \)

Over the 4 time periods (M = 2.61, 2.73, 2.91, & 2.94) no significant change was noted on the night shift: \( F(3,96) = 0.22, p > .01. \)
4.2.2 Frequency of specific agitated behaviours

Each of the 29 agitated behaviours listed in the CMAI was also examined separately to determine the percentage of participants exhibiting specific behaviours during the study period. Table 3 indicates that the following 11 agitated behaviours were manifested by at least 20% of participants at all stages of the study: general restlessness, grabbing, constant requests for attention, negativism, cursing or verbal aggression, repetitious sentences or questions, performing repetitious mannerisms, hitting, pushing, inappropriate robing or disrobing, and making strange noises. Of these general restlessness was the most common agitated behaviour and was manifested by more than 50% of participants. None of the behaviours listed under the category of 'other agitated' behaviours (hiding things, hoarding things, verbal sexual advances, physical sexual advances, intentional falling, throwing things, and eating inappropriate substances) rated among the 11 most commonly occurring agitated behaviours. Of the 29 behaviours, 'tearing things' and 'eating inappropriate substances' were the least common, occurring only in less than 5% of participants throughout the study.
### Table 3

Percentage of Subjects Exhibiting Agitated Behaviours at a Frequency of at Least Once a Week (Rating a Score of 3 or more)

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Pre-1</th>
<th>Pre-2</th>
<th>Post-1</th>
<th>Post-2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aggressive behaviours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grabbing</td>
<td>48.5</td>
<td>48.5</td>
<td>30.3</td>
<td>45.5</td>
<td>43.2</td>
</tr>
<tr>
<td>Cursing or verbal aggression</td>
<td>36.4</td>
<td>42.4</td>
<td>39.4</td>
<td>36.4</td>
<td>38.6</td>
</tr>
<tr>
<td>Hitting</td>
<td>33.3</td>
<td>39.4</td>
<td>27.3</td>
<td>30.3</td>
<td>32.5</td>
</tr>
<tr>
<td>Pushing</td>
<td>30.3</td>
<td>33.3</td>
<td>21.2</td>
<td>21.2</td>
<td>26.5</td>
</tr>
<tr>
<td>Scratching</td>
<td>24.2</td>
<td>15.2</td>
<td>18.2</td>
<td>42.4</td>
<td>25.1</td>
</tr>
<tr>
<td>Spitting</td>
<td>27.3</td>
<td>30.3</td>
<td>9.09</td>
<td>12.1</td>
<td>19.6</td>
</tr>
<tr>
<td>Hurting oneself or others</td>
<td>18.2</td>
<td>9.09</td>
<td>12.1</td>
<td>3.03</td>
<td>10.6</td>
</tr>
<tr>
<td>Kicking</td>
<td>15.2</td>
<td>3.03</td>
<td>3.03</td>
<td>6.06</td>
<td>3.78</td>
</tr>
<tr>
<td>Biting</td>
<td>3.03</td>
<td>3.03</td>
<td>3.03</td>
<td>6.06</td>
<td>1.51</td>
</tr>
<tr>
<td>Tearing things</td>
<td>0</td>
<td>3.03</td>
<td>0</td>
<td>3.03</td>
<td>1.51</td>
</tr>
<tr>
<td><strong>Non-aggressive physical agitation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General restlessness</td>
<td>60.6</td>
<td>51.5</td>
<td>51.5</td>
<td>63.6</td>
<td>56.8</td>
</tr>
<tr>
<td>Repetitious sentences/questions</td>
<td>36.4</td>
<td>54.5</td>
<td>27.3</td>
<td>36.4</td>
<td>38.6</td>
</tr>
<tr>
<td>Performing repetitious mannerisms</td>
<td>33.3</td>
<td>27.3</td>
<td>33.3</td>
<td>42.4</td>
<td>34.0</td>
</tr>
<tr>
<td>Inappropriate robing/disrobing</td>
<td>21.2</td>
<td>21.2</td>
<td>21.2</td>
<td>30.3</td>
<td>23.4</td>
</tr>
<tr>
<td>Pacing</td>
<td>18.2</td>
<td>21.2</td>
<td>24.2</td>
<td>24.2</td>
<td>21.9</td>
</tr>
<tr>
<td>Trying to get to a different place</td>
<td>18.2</td>
<td>12.1</td>
<td>21.2</td>
<td>24.2</td>
<td>18.9</td>
</tr>
<tr>
<td>Handling things inappropriately</td>
<td>15.2</td>
<td>6.06</td>
<td>3.03</td>
<td>9.09</td>
<td>8.34</td>
</tr>
<tr>
<td><strong>Verbal agitation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant requests for attention</td>
<td>33.3</td>
<td>45.5</td>
<td>51.5</td>
<td>39.4</td>
<td>42.4</td>
</tr>
<tr>
<td>Negativism</td>
<td>36.4</td>
<td>42.4</td>
<td>39.4</td>
<td>39.4</td>
<td>39.4</td>
</tr>
<tr>
<td>Making strange noises</td>
<td>21.2</td>
<td>24.2</td>
<td>21.2</td>
<td>24.2</td>
<td>22.7</td>
</tr>
<tr>
<td>Complaining</td>
<td>15.2</td>
<td>36.4</td>
<td>27.3</td>
<td>6.06</td>
<td>21.2</td>
</tr>
<tr>
<td>Screaming</td>
<td>21.2</td>
<td>15.2</td>
<td>18.2</td>
<td>9.09</td>
<td>15.9</td>
</tr>
<tr>
<td><strong>Other agitated behaviours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiding things</td>
<td>12.1</td>
<td>6.06</td>
<td>9.09</td>
<td>12.1</td>
<td>9.83</td>
</tr>
<tr>
<td>Hoarding things</td>
<td>6.06</td>
<td>9.09</td>
<td>6.06</td>
<td>15.2</td>
<td>9.10</td>
</tr>
<tr>
<td>Throwing things</td>
<td>6.06</td>
<td>9.09</td>
<td>0</td>
<td>9.09</td>
<td>6.06</td>
</tr>
<tr>
<td>Physical sexual advances</td>
<td>3.03</td>
<td>9.09</td>
<td>6.06</td>
<td>3.03</td>
<td>5.30</td>
</tr>
<tr>
<td>Verbal sexual advances</td>
<td>0</td>
<td>3.03</td>
<td>9.09</td>
<td>6.06</td>
<td>4.54</td>
</tr>
<tr>
<td>Intentional falling</td>
<td>6.06</td>
<td>3.03</td>
<td>3.03</td>
<td>3.03</td>
<td>3.78</td>
</tr>
<tr>
<td>Eating inappropriate substances</td>
<td>0</td>
<td>3.03</td>
<td>0</td>
<td>0</td>
<td>0.75</td>
</tr>
</tbody>
</table>
4.2.3 Level of agitation among participants

The level of agitation in terms of the number of agitated behaviours manifested by the participants over the three shifts was also investigated. Table 4 presents a comparison between the results of the present study and those of Cohen-Mansfield, Marx, and Rosenthal (1989) (see discussion section).

Table 4

Mean Number of Agitated Behaviours Exhibited at Least Once a Week per Participant Across the 3 Nursing Shifts

<table>
<thead>
<tr>
<th>Nursing Shifts</th>
<th>Pre-1</th>
<th>Pre-2</th>
<th>Post-1</th>
<th>Post-2</th>
<th>CMR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 3 shifts</td>
<td>12.6 (12.0)** 14.8 (13.2) 14.7 (12.9) 14.9 (11.9) 9.3 (8.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early shift</td>
<td>5.72 (4.98) 6.34 (5.74) 5.68 (4.77) 5.24 (4.06) 3.8 (4.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late shift</td>
<td>3.93 (4.51) 5.41 (5.10) 5.72 (4.98) 6.44 (5.44) 3.3 (3.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Night shift</td>
<td>2.96 (3.69) 3.06 (3.46) 3.31 (3.58) 3.24 (3.68) 2.1 (2.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Standard deviation is presented in parentheses
It will be noted that the mean number of agitated behaviours exhibited at least once a week per participant over a 24-hour period was consistently above 12 for the study period. On the early shift each participant manifested at least 5.24 agitated behaviours at least once a week over the 4 data collection phases. The late shift indicated each participant exhibited at least 3.9 agitated behaviours, while the night shift showed at least 3.46 agitated behaviours per participant over the study period.

Agitation level in terms of the number of agitated behaviours exhibited per participant on each of the three nursing shifts may also be noted in Table 4. Prior to the intervention, the early shift recorded the highest ($M = 5.72 \& 6.34$) and the night shift the lowest number of agitated behaviours ($M = 3.69 \& 3.46$). Following the intervention, the highest number of agitated behaviours was observed on the late shift ($M = 5.72 \& 6.44$) and the lowest on the night shift ($M = 3.58 \& 3.68$).

### 4.2.4 Agitation and cognitive status

Previous studies (Cohen-Mansfield, Marx, & Rosenthal, 1989, 1990) have suggested that the level of cognitive impairment affects participants' agitation. Pearson correlation coefficients were, therefore, calculated to see if this study showed similar results. There was no relationship between the BCRS scores and the level of agitation for this group of participants: $F = -.04$, $d.f. = 31$, $p > .05$. 

54
4.3 Sleep

Sleep was analysed under three categories: (a) sleep by day, which includes sleep observations from the early and late shifts, (b) sleep by night, that is, sleep observations from the night shift, and (c) sleep over 24 hours. A repeated measures analysis of variance was performed on data pertaining to each category of sleep.

4.3.1 Sleep by day

Overall ANOVA results of sleep by day indicate a significant change in sleep: $F(3, 96) = 4.75, p < .01$. A significant difference was evident between the two pre-intervention periods and Post-1: Pre 1 vs Post-1, $F(1, 32) = 9.84, p < .01$; Pre-2 vs Post-1, $F(1, 32) = 8.62, p < .01$. Participants slept more than they did prior to the intervention. However, as time went on participants' sleep was reduced during the day as indicated by a significant change between Post-1 and Post-2: $F(1, 32) = 10.52, p < .01$, and was about back to pre-intervention levels. (Figure 15)

![Figure 15. Effect on sleep by day](image)

* High scores for sleep by day indicate increased sleep.
4.3.2 Sleep by night

There was no overall significant change observed in sleep on the night shift: \( F(3,96) = 1.90, \ p > .01 \). (Figure 16)

![Graph showing mean scores over different periods]

**Figure 16. Effect on sleep by night**

* High scores for sleep by night indicate reduction in sleep

4.3.3 Sleep over 24 Hours

Sleep over 24 hours was obtained by totalling scores obtained from day and night observations. Overall ANOVA results for 24-hour sleep scores \( (M = 2.182, 2.091, 2.758, \text{and } 2.182) \) indicate a significant change: \( F(3,96) = 6.15, \ p < .01 \). Following the intervention, participants slept more: Pre 1 vs Post-1, \( F(1,32) = 8.32, \ p < .01 \); Pre-2 vs Post-1, \( F(1,32) = 9.92, \ p < .01 \). But as time went on there was a significant reduction in sleep over a 24-hour period: Post-1 vs Post-2: \( F(1,32) = 19.38, \ p < .01 \), returning to pre-intervention levels. (Figure 17)
Figure 17 Effect on 24-hour sleep

To summarise, while night sleep was not affected by the intervention, there was a significant change in 'sleep by day'. Initially, following the intervention participants slept more during the day. However, as time progressed, there was a significant reduction in sleep. Participants spent less time asleep during the day, returning to pre-intervention sleep. The same effect was observed over a 24-hour period. In general, while at first participants slept more over a 24-hour period, later their sleep was significantly reduced and mirrored pre-intervention levels.
CHAPTER FIVE

Discussion

This study investigated whether environmental manipulation in terms of facilitating freedom of choice in relation to when, where, and how activities of daily living were conducted had an effect on agitation in dementia sufferers. Agitation level was examined under 4 categories: aggressive behaviours, non-aggressive physical agitation, verbal agitation, and 'other agitated' behaviours.

5.1 Summary of findings

Results of the study suggest that, following the intervention of 'environmental manipulation', on the early shift participants' verbal agitation was significantly reduced, whereas, 'other agitated' behaviours increased significantly. On the late shift, participants' verbal agitation increased significantly following the first 4 weeks of data collection and this increase remained high following the intervention. No significant effects were found in relation to any of the other categories of agitated behaviours for any of the shifts.

The amount that participants slept during the day initially increased significantly following the intervention (Post-1). By the end of the study period (Post-2) the amount that participants slept returned to pre-intervention levels. Night sleep was not significantly altered following the intervention. Examination of sleep results over a 24-hour period suggests that initially the amount that participants slept increased following the intervention and then reverted back to pre-intervention levels.
Using descriptive statistics, the effect of the intervention on agitation was examined for each of the three nursing shifts by comparing the total number of agitated behaviours, that is, behaviours occurring at least once a week, over the four time periods: Pre-1, Pre-2, Post-1, and Post-2 (Figure 14). Although there was a clear trend in that the total number of agitated behaviours during the early shift was less following the intervention, the change was not significant. On the late shift, total agitated behaviours steadily increased from the beginning to the end of the study period. A significant change was indicated following the intervention. No significant change was noted for the night shift. The number of agitated behaviours manifested by the participants remained steady throughout the four time periods.

When individual agitated behaviours were examined separately, it was found that 20% or more of participants exhibited 11 distinct agitated behaviours throughout all stages of the study: general restlessness, grabbing, constant requests for attention, negativism, cursing or verbal agitation, repetitious sentences or questions, performing repetitious mannerisms, hitting, pushing, inappropriate robing or disrobing, and making strange noises. Only two agitated behaviours - tearing things, and eating inappropriate substances - were seen in less than 5% of the participants over all stages of the study.

On the average over the four phases, participants exhibited more than 12 agitated behaviours over a 24-hour period. When individual shifts were examined over the same period, the early shift recorded 5.24, the late shift 3.9, and the night shift 3.46 agitated behaviours per participant.
Whereas prior to the intervention, more agitated behaviours per resident were observed on the early shift than on any other shift, following the intervention the late shift recorded the highest number of agitated behaviours.

Finally, no significant relationship was detected between cognitive status and agitation.

5.2 Decreased verbal agitation on the early shift

Verbal agitation includes the following behaviours: complaining, constant requests for attention, negativism, screaming, and repetitious sentences or questions. A significant decrease in verbal agitation occurred 4 weeks following the intervention of 'environmental manipulation'. This positive effect of the intervention lends support to two important guidelines proposed in the literature for managing agitation in dementia sufferers: (a) to promote optimal autonomy and (b) to avoid confrontational situations (Weiner, 1991).

Staff on the early shift reported that allowing their patients freedom of choice, that is, promoting optimal autonomy relieved them (nurses) from the pressure of constantly trying to meet institutional time schedules, such as meal times and ward activities. Nurses felt they no longer needed to rush their patients with their activities of daily living. This slower pace, it was felt, tended to improve patients' co-operation, which in turn may have accounted for the patients' reduction in verbal agitation. Furthermore, if any resistance or confrontational situation was encountered, as in screaming, negativism, and complaining, staff exercised flexibility by deferring the intervention to a later time when co-operation was indicated by the patient, for example, as one senior nurse remarked, "Why rush? We've now got 24 hours to sort things out". In other words, if a patient demonstrated unwillingness to have a shower on
one nursing shift, nurses on the following shift would take over the responsibility. According to staff, this relaxed atmosphere following the intervention has boosted staff morale. It was also remarked that because of reduced stress many staff felt they were more tolerant of agitated behaviours manifested by patients.

Verbal agitation is exhibited more frequently by cognitively less impaired dementia sufferers. Individuals with a cognitive status score of 3 on the BCRS have been found to manifest the highest frequency of verbal agitation (Cohen-Mansfield, Marx, & Rosenthal, 1990). Participants in the study were severely demented ($M = 6.1$; BCRS). Environmental manipulation had the effect of significantly reducing verbal agitation in these individuals at least on the early shift. It may therefore, be useful for nurses to investigate if environmental manipulation has a similar positive effect on more cognitively intact dementia sufferers.

5.3 Change in verbal agitation on the late shift

A significant increase in participants' verbal agitation was observed in the second phase prior to the intervention. Following the intervention, although verbal agitation remained high, it was stable. Accordingly, while the intervention did not result in a reduction it is conceivable that it may have had a stabilising effect on verbal agitation.

5.4 Increase in 'other agitated' behaviours on the early shift

Although verbal agitation was reduced on this shift, 'other agitated' behaviours rose significantly at the end of the data collecting period. Behaviours included in this category are: hiding things, hoarding things, verbal sexual advances, physical sexual advances, intentional falling, throwing things, and eating inappropriate substances. The effect of the
intervention appears to have made these behaviours worse. It may be observed from Table 3 that less than 10% of participants exhibited these behaviours. It is possible that for these few individuals, freedom of choice could have reinforced their behaviours. For instance, showing tolerance towards verbal sexual advances may serve to encourage a feeling in these individuals that this behaviour is acceptable. It may, therefore, suggest that allowing freedom of choice may not be an appropriate approach to manage these behaviours.

5.5 Other categories of agitation

For the other categories of agitated behaviours, that is, aggressive behaviours and non-aggressive physical agitation, no significant change was noted across the three nursing shifts for any of the data collecting periods. These behaviours are more common among severely demented people (Cohen-Mansfield & associates, 1989, 1990). The mean cognitive score on the BCRS for the participants was 6.06, where 1 indicates normal functioning and 7 denotes complete cognitive impairment. They were therefore, severely demented. It is possible that they may not be amenable to much change at least in terms of aggressive behaviours and non-aggressive physical agitation. It may also be that because of the relatively short period of evaluation, the effect of the intervention did not emerge in relation to these two dimensions of agitation.

5.6 Effect of intervention on agitated behaviours

Descriptive statistics (Figure 14) indicate a reduction, though not significant, in the total number of agitated behaviours on the early shift following the intervention. While little change was seen on the night, there was a steady rise in agitation on the late shift throughout the study period. A significant change in the level of agitation occurred in the pre-
intervention phases on the late shift. However, following the intervention the total number of agitated behaviours remained high but stable. As discussed earlier, nurses on the early shift felt allowing freedom of choice facilitated co-operation from their patients, minimised confrontational situations, made the nurses more relaxed, and subsequently reduced agitation in their patients. Nurses on the late shift, however, indicated to the researcher that because of low staffing numbers they felt their ability to offer patients freedom of choice was limited. Compared with the early shift which had a complement of 8 nurses, the late shift comprised only 3 nurses for a full 8-hour shift, and 2 part-time nurses who worked between 5:00 pm and 9:00 pm. While this staffing arrangement might have been appropriate in a task-oriented care module with scheduled evening meal and bed times, staff felt that the same staff/patient ratio was inappropriate for providing freedom of choice. Observations by the researcher also suggest that staff on the late shift were less flexible, most patients had their evening meal at set times and almost all were in bed by the time night shift commenced at 9:00 pm. It is probable that this difference in practice between the day and evening shifts may be related at least to some extent for the differing effects of the intervention in terms of total number of agitated behaviours seen on these two shifts.

5.7 Frequency of agitated behaviours

The high percentage of participants exhibiting many of the 29 agitated behaviours listed in the CMAI supports earlier findings (Hussian & Hill, 1980; Ryden, 1986; Cohen-Mansfield and associates, 1986, 1989, 1990) that agitation is common among dementia sufferers (Table 3). Similarly, general restlessness was also found to be the most common agitated behaviour and was observed in more than half the participants. Agitated behaviours exhibited by 20% or more of the participants were:
general restlessness, grabbing, constant requests for attention, negativism, cursing or verbal aggression, repetitious sentences or questions, performing repetitious mannerisms, and hitting. Earlier studies (Cohen-Mansfield, 1986; Cohen-Mansfield, Marx, & Rosenthal, 1989) list pacing but do not include grabbing and hitting among the most common agitated behaviours found in their participants. It is possible that because half of the participants in the current study were non-ambulant, 'pacing' did not rate as one of the most frequently occurring agitated behaviours.

Of the 29 agitated behaviours (CMAI) on the average across the four time periods the following five were observed in less than 5% of the participants: biting, tearing things, verbal sexual advances, intentional falling, and eating inappropriate substances (Table 3). Tearing things and eating inappropriate substances were the least common agitated behaviours. These two behaviours were observed in less than 5% of the participants at each phase of the study period. Cohen-Mansfield and associates (1989) found the following agitated behaviours occurring in less than 5% of their study participants (n = 408): intentional falling, eating inappropriate substances, throwing things, hurting oneself or others, biting, verbal sexual advances, and physical sexual advances. However, all these behaviours were observed in less than 10% of the current study participants. It may therefore, be said the seven least common agitated behaviours in both studies were similar although participants in the current study were more demented (M = 6.1; BCRS) than those in the earlier study (M = 4.37; BCRS).

5.8 Difference in agitation level between early and late shifts

It will be recalled (Table 4) that prior to the intervention, agitation level in terms of the number of agitated behaviours (behaviours occurring at least once a week) exhibited per participant was highest on the early
shift. Cohen-Mansfield and associates (1989, 1990) report that among 408 nursing home residents of whom 323 manifested varying degrees of cognitive impairment, the highest frequency of agitated behaviours was noted on the early shift. Studies (Meyer, Schalock, & Genaidy, 1991; Patel & Hope, 1992b) on aggressive behaviours - one of the four dimensions of agitation - among elderly individuals in psychiatric hospitals also indicate that these behaviours are more common during the day, and especially in the morning. Staff-patient and patient-patient interactions occur more frequently in the mornings when many activities of daily living are performed. Because aggressive behaviours are generally observed during interpersonal interactions such as getting patients out of bed, attending to hygiene needs, and feeding (Meyer et al., 1991; Ryden, 1988), it is to be expected that the early shift would therefore, rate the highest number of agitated behaviours.

Following the intervention, the late shift rated the most agitated behaviours per participant. If interpersonal interactions, as indicated above, precipitate agitated behaviours, one explanation for this increase in agitation on the late shift may be that there was an increase in interpersonal interactions. Perhaps, because patients were permitted freedom of choice, some activities of daily living may have been transferred to the late shift. Another possible explanation may be that, as discussed earlier, because of the lower staff-patient ratio on the late shift staff were unable to offer as much flexibility as on the early shift, and therefore, resulted in increase in agitated behaviours. Feedback from staff suggest that because patients were allowed to 'sleep in', that is, to remain longer in bed than usual, they were more alert and active on the late shift, and therefore, manifested more agitated behaviours.
5.9 Agitation and cognitive status

The current study found no relationship between cognitive impairment (M = 6.06; BCRS) and agitation. A similar result was also found by Cohen-Mansfield (1986) when studying 66 severely demented individuals (mean cognitive score = 5.9 on the BCRS). Indications are that among severely demented individuals small variations in cognitive functioning do not correlate with levels of agitation (Cohen-Mansfield, 1986). Cohen-Mansfield, Marx, and Rosenthal (1990) investigated the relationship between agitation and cognitive status in 408 participants with mean BCRS score of 4.37 and found that agitation was positively correlated with BCRS scores, that is, the greater the degree of cognitive impairment, the more frequent is agitation in terms of agitated behaviours. This correlation was also found between cognitive impairment and aggressive behaviours (Teri, Larson, & Reifler, 1988; Burns, Jacoby, & Levy, 1990d).

Table 4 presents the mean number of agitated behaviours exhibited per participant across the three nursing shifts. It will be noted that on the average the severely demented participants (M = 6.06; BCRS) in the present study recorded more agitated behaviours than the 408 cognitively less impaired participants (M = 4.37; BCRS) in the earlier study (Cohen-Mansfield, Marx, & Rosenthal, 1989). Whereas over the three nursing shifts participants in the earlier study recorded an average of 9.3 agitated behaviours, at least 12.6 agitated behaviours per participant were observed in the study. On the early shift, while at least 5.24 agitated behaviours per participant were observed in the study, only 3.8 agitated behaviours were recorded in the earlier study. On the night shift on average, participants in the earlier study manifested 2.1 as compared to at least 2.96 agitated behaviours in the present study.
5.10 Sleep by day

During the day, which included the early and late shifts, participants slept more, immediately following the intervention. By the end of the data collecting period, participants were sleeping a similar amount to pre-intervention levels. Perhaps, this result is not surprising, because the intervention facilitated freedom of choice, which included not getting patients out of bed in the morning until they were awake and indicated, whether verbally or non-verbally, willingness to do so. A number of patients chose to stay in bed later than they had under the task-oriented system, whereas others were still in bed at 10:00 am. Day recording began at 7:00 am at which time prior to the intervention nurses would have routinely commenced getting the patients out of bed to be in time for breakfast at 8:00 am. Furthermore, no attempt was made to eliminate or reduce daytime napping. In the evening patients were free to retire to bed at any time.

It is therefore, reasonable to expect that following the intervention, individuals would set their own sleep schedule, that is, wake up spontaneously in the morning and retire to bed when sleepy, which is the norm for most people in the community. The initial increase in sleep by day may therefore, suggest this adjustment of individual sleep pattern. However, a return to pre-intervention levels of sleep in the last data collecting stage needs to be investigated. Could it be that staff behaviour changed and reverted back to pre-intervention routine? Observations suggest that this was not the case at least on the early shift. At least two of the senior staff worked from Monday to Friday. Furthermore, the director of nursing was directly involved in ensuring full implementation of the intervention. However, the researcher observed that on the late shift in addition to a lower staff/patient ratio there was lack of continuity.
in terms of maintaining regular staff who were familiar with the intervention. Agency nurses, relief nurses, and untrained staff were more frequently observed on the late shift. It is possible that these factors may have had a bearing on the intervention where gradually participants were given less choice as to when they retired to bed. It is conceivable that by retiring to bed earlier, participants also started to wake up earlier in the morning, which resulted in a reduction in 'day sleep' in the final data collecting period.

5.11 Sleep by night

Although not reaching significance, from a clinical perspective participants slept less immediately following the intervention, and returned to their pre-intervention levels at the end of the data collection period. This sleep pattern may be expected given the discussion above, if patients are sleeping more during the day, that is, getting out of bed later, they are likely to sleep at a later time at night, and therefore, record less amount of night sleep.

In this context, it may be useful to consider existing recommendations for sleep hygiene in the elderly population. It is suggested that elderly people should adhere to regular rising time in the morning and should retire to bed only when ready to sleep (Muncy, 1986) and preferably not before 9:00 pm (Weiner, Debus, & Goodkin, 1991). In addition to keeping consistent bedtime, Hoch, Reynolds III, and Houck (1988), suggest that the elderly should avoid or reduce daytime napping. The intervention permitted participants to arise from and retire to bed freely, and allowed daytime napping. Such a departure from recommended sleep hygiene was expected to affect sleep at night. However, findings of the study demonstrate that although participants following the intervention slept more during the day, there was no
significant change in their sleep at night. This result is in agreement with findings from the study by Regestein and Morris (1987) which reveal that daytime sleep does not reduce night sleep in dementia sufferers, that is, those individuals who sleep during the day also sleep at night, while those who are restless at night are also restless during the day. The question may therefore, be posed whether institutionalised dementia sufferers are like healthy elderly people who, according to Dement, Miles and Carskadon (1982) tend to be 'chronically sleep-deprived'. Hayter (1983), therefore, recommends that in developing a nursing care plan, each elderly individual's sleep pattern should be considered as the norm for the particular person and accordingly information pertaining to the individual's sleep behaviour should be collected to serve as baseline data.

5.12 Limitations of the study

A number of factors need to be considered when evaluating the study. The time period for the study may have been too short and therefore, perhaps, inadequate for evaluating all of the possible changes in participants' agitation. In addition, the sample was considerably small and consisted mostly of severely demented participants. Absence of a wide range in cognitive level did not facilitate investigation of the effect of the intervention on dementia sufferers at different levels of cognitive impairment. While a "within-subject" design was used for the present study, inclusion of a control group to compare and determine the effect of environmental manipulation on agitation would have provided a more accurate evaluation of the intervention.
5.13 Conclusion

Findings of the study suggest environmental manipulation may be useful in reducing verbal agitation at least on the early shift. Although a significant increase occurred among behaviours listed under 'other agitated' behaviours, its impact was not widespread as only a very small percentage of participants exhibited these behaviours.

It may be claimed that the results of the study support the conceptual model. Facilitating congruence or fit between the participants and the environment, that is, permitting institutional flexibility improved the well-being of the participants in terms of a reduction in agitation during the early shift. In addition, environmental manipulation allowed staff to maximise patients' independence in performing their activities of daily living. The ability of the patients to meet their needs at their own pace without being rushed by staff is another adaptation of the environment to facilitate congruence.

In relation to sleep, environmental manipulation as an intervention provides flexibility with regard to bed routine in terms of when a person gets out of bed in the morning and retires to sleep in the evening. This approach minimises confrontational situations with patients who are not co-operative - a method advocated in the literature to avoid aggressive behaviours. Findings of the study suggest that night sleep was not significantly affected by allowing flexible bed routine or by tolerating daytime napping.

Finally, staff in general demonstrated strong support for flexibility in relation to institutional time schedules. Feedback suggests overall improved staff morale, which in turn enhanced the quality of care given to the patients.
5.14  Nursing implications

As care-givers nurses respond to the needs of their patients. One basic human need regardless of cognitive status is the ability, whether actual or perceived, to exercise choice. Providing freedom of choice to dementia sufferers responds to this need and maintains their individual dignity. In addition the study suggests that freedom of choice at least reduces verbal agitation on the early shift. Furthermore, a positive downward trend in total agitated behaviours following the intervention, although not statistically significant, is clinically important in as much as currently there are no clear nursing guidelines to manage agitation. It is, therefore, essential that nurses in their respective nursing streams: clinical, educational, and research further investigate the effectiveness of this intervention.

The effect of freedom of choice on sleep in dementia sufferers is another important consideration. The study indicates that allowing patients to maintain their own individual sleep norm does not affect sleep at night. In addition, this approach reduces confrontational situations often resulting from nurses attempting to get dementia sufferers out of bed in the morning or to retire to bed in the evening regardless of their explicit or implicit wish.

From a management perspective, allowing flexibility with institutional time schedules may be a useful approach as it appears to benefit both patients and staff. Feedback from staff indicates that because of a reduction in agitation in their patients and more flexible time schedules they (nurses) are less stressed and are able to provide improved care to their patients. However, it may be necessary to review staffing arrangements to permit full evaluation of the intervention. While it may not be feasible to increase overall staff numbers, it may be possible to
provide improved staff/patient ratio on the late shift by rescheduling nursing shifts to meet the needs of the patients. For example, of the 8 nurses on the early shift, two could start at 10:00 am and finish work at 6:30 pm.

5.15 Recommendations for future studies

Future studies may need to involve a large sample to include a greater spread of cognitive levels in order to investigate the effect of environmental manipulation on dementia sufferers at different stages of cognitive decline. It will also permit examining the relationship between cognitive level and each dimension of agitation. Furthermore, although much effort was put into training staff for the current study, the researcher found that despite the enthusiasm of the director of nursing and the nurses, not all staff were adequately trained to implement the intervention. It is important that future studies include only adequately trained staff to ensure improved implementation of environmental manipulation and a more accurate assessment of agitated behaviours. Finally, in future research a more balanced staff/patient ratio, particularly between early and late shifts, may be needed to provide environmental manipulation and to monitor its effect on agitation.
References


### General Information Sheet

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>MALE</td>
</tr>
<tr>
<td>Marital Status</td>
<td>MARRIED</td>
</tr>
<tr>
<td></td>
<td>DIVORCED</td>
</tr>
<tr>
<td>Sleep Medication</td>
<td>YES</td>
</tr>
<tr>
<td>Type of Dementia</td>
<td></td>
</tr>
<tr>
<td>Brief Cognitive Rating Scale</td>
<td></td>
</tr>
</tbody>
</table>

---

**Should you have any queries about this sheet or any aspect of the study, please contact Ernie Matthews on tel: 4466185 (home) 3820848 (work). Thank you for your co-operation!**
Appendix  B

COHEN-MANSFIELD AGITATION INVENTORY (CMAI)

1. Pacing
2. Inappropriate robing or disrobing
3. Spitting
4. Cursing or verbal aggression
5. Constant requests for attention
6. Repetitious sentences or questions
7. Hitting
8. Kicking
9. Grabbing
10. Pushing
11. Making strange noises
12. Screaming
13. Scratching
14. Trying to get to a different place
15. General restlessness
16. Complaining
17. Negativism
18. Handling things inappropriately
19. Hiding things
20. Hoarding things
21. Tearing things
22. Performing repetitious mannerisms
23. Verbal sexual advances
24. Physical sexual advances
25. Intentional falling
26. Throwing things
27. Biting
28. Eating inappropriate substances
29. Hurting oneself or others

Operational definitions of each item to be discussed with nurses prior to commencement of data collection.

Items will be rated on the CMAI SCALE.
December 7, 1992

Ernest. A. Matthews  
Nurse Researcher  
Snenton Park  
Western Australia 6021

Dear Mr. Matthews,

Thank you for your interest in the Cohen-Mansfield Agitation Inventory (CMAI). Please find enclosed the instrument, an instruction manual for its use, as well as an article in which the CMAI is described. The enclosed manual includes descriptions of the measures, psychometric information, and a brief bibliography. In addition to the CMAI, I am also enclosing the Observational Sleep Assessment Instrument (OSAI) as you requested, along with an article in which the OSAI is described.

You are welcome to use the CMAI and the OSAI or parts of them in your research, with appropriate citation of the source in any papers or reports you prepare. If you do use the instruments, I would appreciate learning of your results. We request a $5.00 fee for photocopying and mailing. Please make your check payable to the Research Institute.

You mentioned in your letter that it is difficult to obtain copies of our work on agitation, so I am enclosing several articles you might find of interest. Also, I am enclosing our list of publications, please let me know if you would like us to send you any of them.

Sincerely,

Jiska Cohen-Mansfield, Ph.D.  
Director

6121 Montrose Road • Rockville, Maryland 20852 • (301) 770-8449
Appendix C

SLEEP SCALE


NIGHT SLEEP

No insomnia/restlessness
And/or: Averages 6-8 uninterrupted hours of sleep nightly.

Restlessness at night or occasional insomnia (greater than 1 hour). May complain of poor sleep.
And/or: Restlessness after 11 pm, occasional difficulty falling asleep, or less than 6 hours of solid sleep the majority of nights.

Intermittent early morning awakening or frequent difficulty falling asleep (greater than 1 hour). May get out of bed for purposes other than voiding.
And/or: Frequent sleep interruptions, rarely sleeping longer than 2-3 hour intervals.

Almost nightly sleep difficulties, insomnia, frequent awakening, and/or agitation, which is profoundly disturbing the patient's sleep-wake cycle.
And/or: Agitation/restlessness, throughout the entire night.

SLEEP: DAYTIME DROWSINESS

No apparent drowsiness.
And/or: Does not nap during the day.

May appear drowsy during the day with occasional napping.
And/or: Would go to bed before 8:00 pm if not directed to stay up, or difficult to awaken in the morning after 8 hours of solid sleep. May appear drowsy during the day despite adequate sleep.

May frequently nod off during the day.
And/or: Frequently appears drowsy or sedated despite ongoing activities.

Continuously attempts to sleep during the day.
And/or: Might stay in bed continuously if not directed to get up. Noted to be napping even during stimulating activities.


18 December 1992

Ernest A. Matthews
Selby Lodge

WESTERN AUSTRALIA

Dear Mr. Matthews:

I am in receipt of your letter dated 19 November 1992. Thank you for your interest in the psychogeriatric nursing assessment protocol, and I am happy to give permission for you to use it.

Sincerely,

Ivo L. Abraham, PhD, RN
Associate Professor of Nursing
Associate Professor of Behavioral Medicine and Psychiatry
Director, Center on Aging and Health
Co-Director, Southeastern Rural Mental Health Research Center

mhp
Appendix D

Brief Cognitive Rating Scale
(Modified version)

<table>
<thead>
<tr>
<th>Axis</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis I</td>
<td></td>
</tr>
<tr>
<td>Concentration</td>
<td>1 No objective or subjective evidence of deficit concentration</td>
</tr>
<tr>
<td></td>
<td>2 Subjective decrement in concentration ability</td>
</tr>
<tr>
<td></td>
<td>3 Objective signs of poor concentration</td>
</tr>
<tr>
<td></td>
<td>(e.g., on subtraction of serial 7's from 100)</td>
</tr>
<tr>
<td></td>
<td>4 Definite concentration deficit for persons of their background</td>
</tr>
<tr>
<td></td>
<td>(e.g., on subtraction of serial 4's)</td>
</tr>
<tr>
<td></td>
<td>5 Marked concentration deficit</td>
</tr>
<tr>
<td></td>
<td>(e.g., giving months backward or serial 2's from 20)</td>
</tr>
<tr>
<td></td>
<td>6 Forgets the concentration task; frequently begins to count forward</td>
</tr>
<tr>
<td></td>
<td>when asked to count backward</td>
</tr>
<tr>
<td></td>
<td>7 Marked difficulty counting forward to 10 by 1'.</td>
</tr>
<tr>
<td>Axis II</td>
<td></td>
</tr>
<tr>
<td>Recent memory</td>
<td>1 No objective or subjective evidence of deficit in recent memory</td>
</tr>
<tr>
<td></td>
<td>2 Subjective impairment only</td>
</tr>
<tr>
<td></td>
<td>(e.g., forgetting names more than formerly)</td>
</tr>
<tr>
<td></td>
<td>3 Evident deficit in recall of specific recent events</td>
</tr>
<tr>
<td></td>
<td>No deficit for major events.</td>
</tr>
<tr>
<td></td>
<td>4 Can't recall major events of previous weekend or week.</td>
</tr>
<tr>
<td></td>
<td>5 Unsure of weather: may not know current president or current address.</td>
</tr>
<tr>
<td></td>
<td>6 Occasional knowledge of some recent events</td>
</tr>
<tr>
<td></td>
<td>7 No knowledge of any recent events.</td>
</tr>
<tr>
<td>Axis III</td>
<td></td>
</tr>
<tr>
<td>Past memory</td>
<td>1 No subjective or objective impairment in past memory.</td>
</tr>
<tr>
<td></td>
<td>2 Subjective impairment only: can recall primary school teachers.</td>
</tr>
<tr>
<td></td>
<td>3 Some gaps in past memory on detailed questioning.</td>
</tr>
<tr>
<td></td>
<td>4 Clean-cut deficit. The spouse recalls more of the patient's past than</td>
</tr>
<tr>
<td></td>
<td>the patient.</td>
</tr>
<tr>
<td></td>
<td>5 Major past events sometimes not recalled (e.g., names of schools</td>
</tr>
<tr>
<td></td>
<td>attended).</td>
</tr>
<tr>
<td></td>
<td>6 Some residual memory of past (e.g., may recall country of birth or</td>
</tr>
<tr>
<td></td>
<td>former occupation).</td>
</tr>
<tr>
<td></td>
<td>7 No memory of the past.</td>
</tr>
<tr>
<td>Axis IV</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td>1 No deficit in memory for time, place, identity of self or others.</td>
</tr>
<tr>
<td></td>
<td>2 Subjective impairment only. Knows time to nearest hour, location.</td>
</tr>
<tr>
<td></td>
<td>3 Any mistake in time &gt; 2 hours; day of week &gt; 1 day; date &gt; 3 days.</td>
</tr>
<tr>
<td></td>
<td>4 Mistakes in month &gt; 10 days or year &gt; 1 month.</td>
</tr>
<tr>
<td></td>
<td>5 Unsure of month, year, or season; unsure of locale.</td>
</tr>
<tr>
<td></td>
<td>6 No idea of date. Identifies spouse but may not recall name.</td>
</tr>
<tr>
<td></td>
<td>Knows own name.</td>
</tr>
<tr>
<td></td>
<td>7 Can't identify spouse; may be unsure of personal identity.</td>
</tr>
</tbody>
</table>

(Reisberg, Schneck, Ferris, Schwartz, DeLeon, 1983)
Appendix E

The Chairperson
The Research and Ethical Review Committee
Edith Cowan University
Churchlands Campus
Pearson St
Churchlands 6008

Ernest A. Matthews

Date 22 September, 1992

Dear Sir,

I am a Master's student (nursing) at Edith Cowan University and I am employed as Staff Development/Research nurse at Selby Lodge, Shenton Park. Part of my Master's course involves a research thesis.

I hereby request your permission to conduct a study on the effect of environmental manipulation on agitation and 24-hour sleep in dementia sufferers in an institutional setting. Four copies of my research proposal are enclosed.

Yours faithfully,

Ernest A. Matthews
Appendix F

To
Mrs ..........  
Director of Nursing,

Ernest A. Matthews

Date 22 September 1992

Dear Mrs......

I understand from our recent discussion that an administrative decision has been reached to make a transition from a task-oriented to a client oriented care module in your nursing home. The focus will be to facilitate freedom of choice for the residence with regard to performing their activities of daily living.

I wish to request your permission to avail myself of this opportunity to conduct a study in a natural setting. Part of my course as a Master student (nursing) involves a research study.

The study will involve monitoring agitated behaviour and 24-hour sleep of the residents, over a total period of 16 weeks, including 8 weeks prior to and 8 weeks following the introduction of the new client-care module.

The purpose of my study is to investigate if a flexible approach in caring for dementia sufferers affects agitation or sleep.

The study will be strictly confidential. No names will be involved and at no time will any participant be identified.

I will also seek permission from the next-of-kin.

I thank you for your kind assistance.

Yours sincerely A

Ernest A. Matthews
Appendix G

(Invitational letter to potential subjects and their next-of-kin)

Ernest A. Matthews

Date 22 September 1992

Dear Sir/Madam,

I am a Masters student (nursing) at Edith Cowan University. Part of my course involves conducting a research.

I am interested in investigating if rules and regulations and time-schedules in a nursing home are made more flexible, whether residents will experience less stress and perhaps improve the quality and quantity of their sleep.

No names will be involved and any observations conducted by the nurses will remain confidential.

The director of nursing will also be contacting you to seek your permission to proceed with the study.

I have enclosed a consent form that states your rights with regard to the study.

I thank you for your kind co-operation.

Yours sincerely,

Ernest A. Matthews
Study Title: The Effect of 'Environmental Manipulation' on Agitation and 24-hour Sleep in Dementia Sufferers in an Institutional Setting.

Researcher: Ernest A. Matthews, Master's student (nursing), at Edith Cowan University.

Researcher Contact:
Tel: 4466185 (home)
3820848 (work)

Purpose of Study: The study will investigate if permitting residents in the nursing home to choose when, where, and how they perform their activities of daily living, such as, going to bed, arising in the morning, eating, attending to hygiene needs and relaxing, has any effect on their agitation and sleep. Nurses will conduct the observations over a total of 16 weeks. The observations are routine nursing practice. No names will be involved when the nursing observations are studied by the researcher. The information will be kept strictly confidential.

Participants are free to withdraw from the study at any time without incurring any penalty. There is no apparent risk or benefit to the participants. However, information gathered from the study may provide nurses with an improved understanding of the behavioural activities and sleep of dementia sufferers.

Please read the following statement carefully before you sign it.

I, ____________________________________, HEREBY AGREE TO PERMIT MY NEXT OF KIN, ____________________, TO PARTICIPATE IN THE STUDY AS A VOLUNTEER. THE STUDY HAS BEEN EXPLAINED TO ME TO MY SATISFACTION. I UNDERSTAND THAT I MAY REVOKE MY CONSENT AT ANY TIME.

Signature...... Researcher......
Date......
Witnessed by (signature)...... Date......