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Benzodiazepine use in elderly residents of a ritirement village in Sandton: Knowledge, attitudes and perceptions of the patients, the nursing staff and the prescribing doctors

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BENZODIAZEPINE USE IN ELDERLY RESIDENTS OF A RETIREMENT VILLAGE IN SANDTON: KNOWLEDGE, ATTITUDES AND PERCEPTIONS OF THE PATIENTS, THE NURSING STAFF AND THE PRESCRIBING DOCTORS

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the degree of Master of Family Medicine.

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DECLARATION

I, Meryl Anne Lambson, declare that this dissertation is my own work. It is being submitted for the degree of Master of Family Medicine in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

26th day of August 2003.

For all my friends at Rosehaven -
And in memory of those who are no longer with us

To my beloved family:
Barry, Caitlyn and Daniel.
Thank you for your patience, understanding and support.

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ABSTRACT

Residents of a Retirement Village (Rosehaven), in both the frail and the non-frail sections, were the subjects for this study. They were interviewed to determine demographic characteristics and attitude towards sleep and sleep problems. Subjects living in the frail care facility were compared to those living independently. In addition, the chronic use of benzodiazepines, and the perceptions of both the subjects, and the medical and nursing personnel caring for them, was studied. The physical and mental status of subjects currently taking benzodiazepines was compared with those who were not.

No significant differences in demographic features, was found between the frail and the non-frail subjects. However, when subjects taking benzodiazepines were compared with those who were not, several interesting differences were determined. Frail subjects were more likely to be taking benzodiazepines. Sleep difficulties, and perception of poor sleep quality was more likely in the benzodiazepine group. Subjects taking benzodiazepines were more likely to be anxious, and to have suffered falls and resulting injuries.

The daily functioning of subjects was rated using three well-validated scales: Instrumental Activities of Daily Living, Mini Mental State Examination, and the Geriatric Depression scale. Those subjects taking benzodiazepines scored significantly worse on all of these scales, independent of frail status (i.e. within both frail and non-frail groups, subjects taking benzodiazepines scored significantly worse).

In spite of the above findings, subjects' perception of benzodiazepines was positive, and they believed them to be helpful. Nursing staff also perceived benzodiazepines to be beneficial medications. Most of the general practitioners questioned had doubts as to the safety of benzodiazepine use in elderly patients, however they were also generally happy to continue to prescribe them.

1 INTRODUCTION

1.1 Background

Since their introduction to medical practice in the 1960's, benzodiazepines have become among the most commonly prescribed medications. Their perceived safety has resulted in a liberal attitude among physicians regarding their prescription.[1] Increasingly, however, concern about the abuse potential of benzodiazepines arose. Early on, it was established that dose-related, sedative-hypnotic-type dependence occurs, although this is rarely seen in its pure form in a clinical population. Of more concern clinically is that even in therapeutic doses, when taken chronically, benzodiazepines use can produce dependence.[1]

Practicing clinicians are frequently faced with a dilemma: a patient anxious to repeat a prescription for a medication that they feel is of great benefit to them, and a nagging worry that one is doing the patient no good by acquiescing to their request. This is of particular concern in the elderly age group where benzodiazepine use is widespread, and potentially more harmful as these patients are already disadvantaged by many of the effects of ageing. The profusion of clinical recommendations found in the literature reflects a trend away from the use of the benzodiazepine class of anxiolytics and sedatives.[2]

1.2 Research question

Is the use of benzodiazepines detrimental to the health and well-being of an elderly population resident in a Retirement village in Sandton?

1.3 Aims

The aims of this study are to examine an elderly population resident in a Retirement Village and to:

- Establish the prevalence of benzodiazepine use in this retirement village
- Gain some insight into the chronic use of benzodiazepines in an elderly population, from both the subject's and the medical personnel's perspective.
- Compare the physical and mental status of subjects currently taking benzodiazepines with those who were not.

1.4 Objectives

- Determine the demographic features of subjects resident in a Retirement Village in Sandton.
- Establish the attitude of nursing staff caring for the institutionalized elderly, towards benzodiazepine use by their charges.
- Establish the prescribing doctors' attitude to the chronic use of benzodiazepines in elderly patients.
- Interview of subjects by means of a Researcher administered questionnaire to determine:

- The frequency of benzodiazepine use in the residents of the village.
- The subjects' assessment of sleep quality and their perceptions of sedative hypnotic medication.

❖ Detailed questioning of those subjects found to be current, chronic benzodiazepine users to establish their perceptions of both the medication and their doctor's attitude to their prescription.

❖ Ascertain the number of falls sustained, and whether they resulted in significant injury.

❖ Testing of subjects:
  - ➢ Assessment of functional ability in relation to the activities of daily living
  - ➢ Assessment of mental status
  - ➢ Assessment of mood and detection of depression
  - ➢ Comparison of the group of patients using benzodiazepines with those not using any of this class of medication.
  - ➢ Establish differences between subjects living in a frail care setting and those living independently.

2 LITERATURE REVIEW

2.1 *Benzodiazepines*

Benzodiazepines are tranquilizer or sedative hypnotic drugs. They are highly lipid soluble and diffuse rapidly into the central nervous system, where they bind to the GABA[a] receptor located almost exclusively on the postsynaptic nerve endings in the CNS (especially the cerebral cortex).[3] They have a broad spectrum of pharmacological activities: they are anticonvulsant, anxiolytic, and sedative. Endocrine and autonomic responses to emotional stimuli are markedly attenuated, and they reduce skeletal muscle tone.[3]

Since chlordiazepoxide was introduced in 1961, the benzodiazepines have had multiple roles in the pharmacotherapy of various disorders. This class of drugs has been considered one of the safest in use for more than 35 years, especially when benzodiazepines are compared with the barbiturates, which they replaced. They are still among the most commonly used classes of medications.[4,6] Increasingly, however, concern about the abuse potential of benzodiazepines arose. Dose related, sedative-hypnotic-type dependence has been well established, although this is rarely seen in its pure form in a clinical population. Of more concern is data demonstrating that therapeutic doses of benzodiazepines when taken chronically can produce physical dependence.[1] The development of physiological dependence is somewhat predictable and is proportional to the total benzodiazepine exposure, although significant variability exists among patients.[5] Tolerance to all of the actions of benzodiazepines can develop. Tolerance to the hypnotic effects tends to develop rapidly, which may be beneficial in daytime anxiolysis but makes long term management of insomnia difficult.[5] Psychologically, long-term use of benzodiazepines may lead to over-reliance on the need for the agent, loss of self-confidence and varying degrees of drug-seeking behaviour.[5]

Other adverse effects include unwanted sedation, psychomotor and cognitive impairment, memory loss, potentiation of other central nervous system depressants, paradoxical disinhibition, and treatment-emergent depression.[3,5,6] Benzodiazepines by themselves have minimal depressant effects on ventilation and circulation, but in combination with other CNS depressants, depression of ventilation may be exaggerated or prolonged.[7] It has been shown that up to 39% of benzodiazepine users may be using over the counter sleep aid medication, in addition to CNS depressants such as alcohol and opiods.[8] This may place the patient at higher risk of psychomotor impairment.[8] Withdrawal effects from therapeutic dosages are predominantly the symptoms of anxiety. Insomnia and sensory hypersensitivity are common. Symptoms may be prolonged (for several months).[5]

In 1967, the Rolling Stones' song, Mother's Little Helper, immortalised the story of the rise and fall of Valium. Certainly benzodiazepines are part of the repertoire of drugs that people become addicted to,[9] while they continue to play an important role in clinical

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[a] **Gamma-amminobutyric acid: one of the principal inhibitory neurotransmitters of the central nervous system**

medicine. Their clinical use, however, must be monitored in the light of the greater awareness of their adverse effects, and their potential for misuse and abuse.[4]

2.2 The Elderly

Current predictions suggest that the number of persons 65 years of age and older will more than double in the United States during the next 30 years.[10] This increase, combined with the disproportionate rate at which elderly patients use medical resources, will require that primary care physicians become increasingly knowledgeable about the needs of geriatric patients and increasingly efficient in the evaluation and management of concerns unique to these patients.[10]

One of the areas where elderly people require special care and consideration is in the use of prescription medication, both because of the physiology of old age and patient factors peculiar to elderly patients. Numerous factors contribute to the high prevalence of drug use in the elderly population. In particular, elderly patients frequently have more than one chronic medical condition, and the symptoms of social deprivation tend to be treated with drugs. Mental disorders are present in a large percentage of the nursing home population. Historically, antipsychotics and benzodiazepines have been used excessively in nursing home residents, often solely for the convenience of staff.[11] Studies have shown that most residents of long-term care facilities receive at least one psychotropic medication.[11] The end result is polypharmacy, which increases the risk of adverse reactions, as well as drug interactions.

Many older people suffer from insomnia, and are commonly prescribed benzodiazepines for symptomatic management. The majority of prescriptions for hypnotic drugs are found in the elderly and in women.[12] Among adults aged 65 and older, up to 42% reported difficulty falling asleep or staying asleep.[13] The prevalence of benzodiazepine prescriptions is also high: 22.5% of people aged 65 and older in Ontario, Canada reported use of benzodiazepines.[14] French data suggests that 37% of people living at home, and 43% of elderly living in institutions were taking benzodiazepines.[33]

Elderly people are more likely than younger patients to develop cognitive impairment, among other side effects, as a result of taking medications. This reflects age- and disease-associated changes in brain neurochemistry and drug handling.[15,16,17,18] Physiological changes in the elderly, which alter the effects of drugs include:
Change in body composition: there is a decrease in total body water and lean body mass with a proportionate increase in body fat, all of which affect the volume of distribution of certain drugs. Particularly, with lipid soluble drugs such as benzodiazepines, this leads to a longer elimination half-life.[16]
Decline in hepatic mass and blood flow, and thus decreased clearance of drugs by the liver.[16]
Decline in the glomerular filtration rate and tubular secretion rate, and consequent decrease in drug elimination rate by the kidney.[16]
Changes occur in end organ responsiveness to medication. For example, increased receptor response to benzodiazepines and opiates has been noted.[16]

2.3 *Benzodiazepine use and the elderly*

Benzodiazepines are widely used to treat sleeplessness and anxiety related symptoms in the elderly; advanced age and female gender are well known demographic indicators for increased risk of hypnotic use.[14,17,18,19,20] In recent years there has been a decline in the number of new prescriptions for benzodiazepines. However a core of long-term users has been left behind, many of who are elderly[21,22] typically using the benzodiazepines as hypnotics.[23] Older people are more likely to continue using these medications for extended periods once they have been prescribed.[24] Doses are often small and consistent, therefore there is the perception that they 'do no harm', and prescriptions are automatically renewed, despite little evidence for the long-term effectiveness of these medications,[23] and the greater awareness of their adverse effects.[4]

The key question is: to what extent is benzodiazepine use in the elderly associated with predictable and preventable adverse drug reactions? The research available on the benefits of benzodiazepine use for insomnia in older people is surprisingly deficient for the magnitude of this issue, however, they have been associated with increased risk of falls and hip fractures, motor vehicle accidents, and cognitive impairment.[23,25,26,27,]

For nursing home residents who require a benzodiazepine, short-acting agents have been recommended, primarily to avoid an increased risk of falls.[28,29] Benzodiazepines with a long duration of action accumulate with repeated doses, and clearance is significantly decreased with age,[30] and thus they can produce marked sedation and psychomotor impairment, which is further accentuated by the polypharmacy practices so often seen in elderly patients.[20] On the other hand, short and intermediate half-life compounds carry a greater risk of rebound, withdrawal reactions, and drug dependence.[6] Although the risk of falls among patients receiving short-acting benzodiazepines is less than that for the long-acting agents, these drugs are still associated with a materially increased risk of nocturnal falls.[28]

About 30% of people aged over 65 years living in the community fall at least once a year; the fall rate is even higher in nursing homes.[31] Falls are an important cause of disability; they are a strong predictor of admission to a nursing home,[31] and are the primary cause of accidental death in the over 65's.[32] Many of these falls lead to fractures, the most serious type being hip fractures.[26,32] One fourth of elderly persons who sustain a hip fracture die within six months of the injury.[32] Risk factors for falls in the elderly include increasing age, medication use, cognitive impairment and sensory deficits.[32] Whether or not the use of benzodiazepines causes falls and fractures has been the subject of more than 50 observational epidemiological studies, most published after 1988.[23,26] While some studies have shown increased risks from long-acting benzodiazepines, higher doses, or longer durations of therapy, others have shown none.[21,23,26,33] At least one large study does indicate an increased risk of hip fractures in patients taking benzodiazepines.[23] However, although the overall risk was significant the magnitude was small. In 2001, the first case control study designed to determine whether benzodiazepines are associated with an increased risk of hip fracture, was published in the British Medical Journal.[33] The findings were that benzodiazepines do not increase the risk of hip fracture, regardless of the half-life of the particular agent.[33] This publication was however greeted by a rush of counter

publications and commentary, criticism and comment reaffirming the risks and associations of benzodiazepines with hip fractures. The authors themselves admitted that their data was confounded by the use of hospital controls with a higher possibly higher exposure to these drugs that the general population.[33]

Certainly benzodiazepines are one of a set of predictors for falling.[34] Recurrent falls, which are the major risk factor for fracture, occur more frequently in psychotropic drug users.[21,23,35] However, there are several other risk factors, which may be more important, particularly factors related to physical functioning, such as poor vision, muscle weakness/paresis, parkinsonism or vertigo.[34,36]

2.4 Patient and Physician Perceptions

Whether benzodiazepine use increases cognitive impairment or constitutes a significant problem for older patients varies from patient to patient and is a matter of considerable debate.[30] As a group, elderly long-term benzodiazepine users are less likely to report cognitive decline compared with new users or short-term users.[30] These drugs are most commonly known to cause or exacerbate dementia,[15] and current users of benzodiazepines made more errors on a memory test.[25] Interestingly, benzodiazepines have been found to have possible protective effects against Alzheimer's disease![37] In this longitudinal study, individuals aged 75 and older, with a history of continuous use of benzodiazepines were compared with non-users, with respect to the incidence of Alzheimer disease or vascular dementia at three year follow up.[37] However, the design of the latter study was case control, and thus by its very nature has inherent problems establishing cause and effect, and can only really claim an association. For example, it is conceivable that patients who develop dementia sleep better, and therefore are less likely to request a benzodiazepine.

The research available on the benefits and risks of benzodiazepine use in older people is surprisingly deficient for the magnitude of this issue. There seems to be little consensus on the overall risks of benzodiazepine use in older persons, the evidence to date is inconclusive, conflicting, or anecdotal. Patients, on the other hand, generally feel that there is good benefit in using benzodiazepines on a long-term basis for insomnia, and that the risks are low.[38] Physicians, have traditionally been taught that benzodiazepines are generally risky medications, and perhaps dangerous to patients over sixty.[38] This perception is not shared by the patients, nor supported by the literature.[38]

Most of the research in the literature has been conducted in community dwelling elderly or in patients admitted to hospital. As far as could be determined, no previous study on this issue has been conducted in a 'retirement village' situation. The advantage of this is that frail patients, living in a nursing home situation, can be compared to active elderly, still living independently, in relatively controlled circumstances.

2.5 Assessing Geriatric Patients

The value of performing a comprehensive geriatric assessment appears to be equivocal. It is often described in the literature as a multidisciplinary, time-intensive evaluation of a patient previously identified as being at significant risk for imminent morbidity or mortality.[39] However, this type of evaluation is impractical in most primary care settings,

and is seldom used by practicing physicians, and may not be effective in reducing health care utilization or costs.[10]

There is little doubt though, that using simple and easily administered assessment tools, physicians can improve the identification of specific problems that are common in the elderly and also shift their focus from disease-specific intervention to preventive care and proactive medical management.[10]

The selection of the assessment tools used in this study was based on the need for them to be practical, and clinically useful. Many varied risk factors have been associated with morbidity and mortality in elderly populations, deterioration of mental status being just one of these. Mental status is in turn adversely associated with benzodiazepine use. This aspect has not been widely researched, and thus is the focus of this study.

Mental status and physical functioning is often assessed both clinically and for research purposes with the use of validated scales and scoring systems.

The most widely used screening test for dementia is the MMSE (Appendix II).[40] There are numerous practical advantages to the MMSE, most important of which is its widespread acceptance and use in clinical studies.[41]

Depression significantly increases morbidity and mortality. Depressed patients are more likely to be sedentary and malnourished, and less likely to seek help[10]. Lack of motivation and stimulation accentuates dementia. As opposed to dementia, depression is usually characterized by a relatively rapid onset, intact but possibly retarded cognitive abilities and a generally time-limited duration. The Geriatric Depression Scale (Appendix III)[42] is a good screening tool to use in older patients. It avoids issues related to physical symptoms and asks questions requiring a "yes" or "no" answer.[10] It is useful to quantify symptoms of depression, which may be discounted by many clinicians as understandable consequences of medical illness and life events.[41] Based on research that used 'depression rating scales' in elderly populations, the GDS has been the best, validated instrument of depression rating.[43]

Remaining as independent as possible for as long as possible is a primary concern for most elderly patients. The level of supportive assistance that is needed can quickly be determined by asking the patient about his or her ability to perform the IADL (Appendix IV).[44] One recent study indicated that short-term memory and orientation are the domains most closely associated with 'activities of daily living dependance'.[10]

3 METHOD

3.1 Setting

The study was conducted at Rosehaven retirement village. The village is situated in Hurlingham, an affluent suburb of Sandton, in Johannesburg, South Africa. It has 25 residents in the frail care facility and 40 cottages. In the frail care section, each resident has their own bedroom, and the very frail residents share bathroom facilities. The more able residents have their own bathroom and a small kitchenette. All have at least their main meal prepared for them. Twenty-four hour nursing care, under the supervision of a trained nursing sister, is available to aid with functions such as dressing and bathing. Residents in the cottages live independently, but have access to cooked meals, transport, and nursing care if necessary.

3.2 Study population

All 65 residents of Rosehaven were included in the study. Exclusion criteria eliminated only one subject who was unable to participate because of severe dementia. MMSE, IADL and Depression scores were analysed on a sliding scale

3.3 Study sample

A total of 44 subjects were interviewed. All the residents in the frail care section, except for the one who was excluded, were included in the study (19 subjects). Cottage residents (non-frail) were selected by convenience, based on availability (25 subjects).

3.4 Design

The study design is cross-sectional analytic.

Exclusion criteria: those subjects totally unable to be assessed by the MMSE.

A list of all general practitioners who were currently treating residents was obtained from the home management, and written permission requested for their patients to have an opportunity to participate in the study. A list of these patients was sent to the respective practitioners, who were asked to exclude any of their patients meeting the above criterion. If, at the time of the study, further subjects meeting the exclusion criteria were detected, they were also excluded from the study. The treating practitioners were also asked to complete a short 'General Practitioner's questionnaire' (Appendix v), designed to establish their attitude towards long-term benzodiazepine prescription for the elderly.

In addition all the registered nursing staff, employed in the frail-care facility, were asked to complete a similar 'Nurses' questionnaire' (Appendix vi). All subjects included in the study were volunteers.

Nurses and General practitioners questionnaires were different, based on their different roles in caring for the patients. General practitioners are responsible for the prescription of medication while nurses are responsible for their administration.

Informed consent was obtained by means of a standardized letter from the nursing staff (Appendix vii). This letter provided brief information about the study, the approximate length of the interview, and issues of confidentiality.

Questionnaires were drawn up based on personal experience of the interviewer with elderly residents, and nursing home staff. Questionnaire validity was not established.

3.5 Interview procedure

Interviews were all conducted by the researcher, and were held in the subjects' room or cottage. The interview comprised four sections:

1. A questionnaire (Appendix I), designed to obtain basic demographic information, as well as information regarding all medications used, social support and general sleep quality. A question regarding the consumption of tea and coffee was included, as these most commonly used stimulants may affect sleep quality. Subjects who were taking benzodiazepines were then questioned in more detail about these particular medications; reasons for initiation and continuation of the medication, duration and frequency of use, perception of their doctor's attitude and prescribing behavior, desire and /or efforts to stop taking the tablets, and perceptions of usefulness.
2. Assessment of cognitive functioning using Folstein's Mini Mental status examination (MMSE)[40] (Appendix ii).
3. Rating for depression according to the Geriatric Depression Scale[42] (Appendix iii).
4. Assessment of functional ability by means of the Instrumental Activities of daily living scale (IADL)[44] (Appendix iv)

The total time taken for each interview and completion of the three tests was 45 to 90 minutes.

3.6 Limitations

Cottage residents were selected by convenience sampling for availability. This may have lead to bias, in that the more housebound, and therefore possibly more frail, subjects were interviewed.

Although interviewer-administered scales and questionnaires ensure completeness of reporting, which may be important in elderly persons,[43] they may possibly contain interviewer bias that could influence the results. In addition, time constraints limit the scope of the study. Answers to questionnaires are also limited by the perceptions and memory of the subject being interviewed.

3.7 Data analysis

Data was entered in the 'EpiInfo 6' statistical package and uncorrected Chi^2 and Student T-tests were used for analysis. P-values were classified as 'significant' if $p<0.05$.[45]

3.8 Ethical Issues

Permission to conduct the study was obtained from the ethics committee of the University of the Witwatersrand. It was emphasized that participation in the study was completely voluntary, and subjects were informed of their right to decline participation without any penalty of adverse effect on their health care. It was also explained that subjects could choose to withdraw from the study at any time. All participants were assured of confidentiality. Questioning was nonjudgmental, and questions concerning personally or morally sensitive areas were left open. Any possible detriment to the health of patients who are taking benzodiazepines was not discussed. The doctors' questionnaires did not imply, directly or indirectly, any criticism of their prescribing habits.

3.9 Data collection

The study commenced in March 2001 and all data was collected during that year.

4 RESULTS

4.1 Patient Questionnaire

4.1.1 Demographic features of subjects

4.1.1.1 Age

44 subjects were interviewed: they were aged from 67 to 96 years, with a mean age of 83.97 (SD 5.86) years. 19 (43.2%) subjects were 'frail', and 25 (56.8%) were resident in cottages (henceforth referred to as 'non-frail'). The age range in the frail care section was from 73 to 96 years, with a mean of 86.37 years. The non-frail age range was 67 to 91 years with a mean of 82.16 years (see Figure 1). The mean age difference between the two groups is not statistically significant ($p = 0.29$).

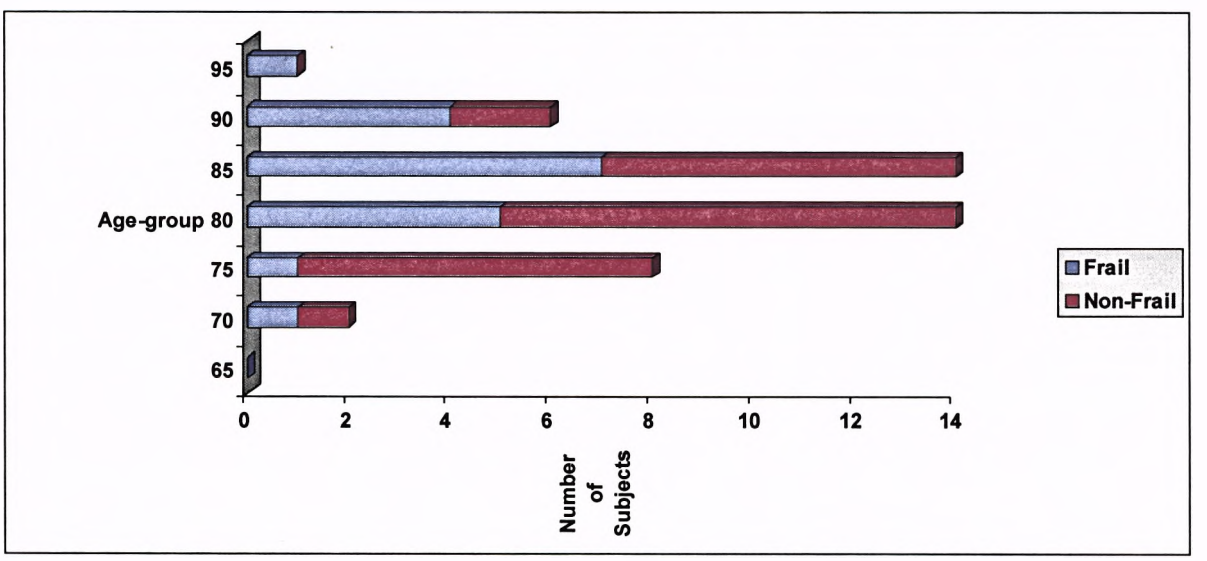


Figure 1: Graph of Frail and Non-frail subjects, and their respective age groups

4.1.1.2 Sex

38 (86.4%) participants were female and only 6 (13.6%) were male. 17 females and 2 males were 'Frail' and 21 females and 4 males were 'Non-frail'. There was no statistically significant difference in the sex of the frail and non-frail groups (Table 1).

4.1.1.3 Marital Status

Most participants, 65.9% (n=29) were widowed. 9.1% (n=4) had been divorced, but in all cases, ex-spouses had subsequently died. Only one married couple was living in the frail section, and in this case the husband was incapacitated and was excluded from the study, although the wife was included (n = 1). 3 married couples (n = 6) were interviewed. 4 subjects were single. No significant differences were found between married subjects and those living alone, with regard to frail status, questionnaire responses or scores on assessment scales (Table 1).

4.1.1.4 Family Involvement

The regularity with which subjects received visitors was used as an indirect gauge of family involvement. This is not an accurate measure, merely an indication of family support for the subject. Only one frail subject had no visitors at all. Of those who received visitors, subjects were asked whether they received visitors weekly (n= 10 frail, 14 non-frail), fortnightly (n= 1 frail, 3 non-frail), monthly (n = 7 frail 5 non frail), or less than once a month (n= 0 frail, 3 non-frail). One frail subject was unsure of how often she received visitors. There was no significant difference between the frail and the non-frail subjects. 54.5% of subjects received weekly visitors (Table 1).

DEMOGRAPHIC FEATURES	SIGNIFICANCE
Sex (male or female)	p = 0.60
Marital status (married, single, widowed or divorced)	p = 0.16
Family living in same city (Johannesburg)	p = 0.97
Visitors (at least weekly, fortnightly, monthly, < once per month	p = 0.25

Table 1. Demographic features of subjects. Comparison of frail and non-frail status.

4.1.2 Medication

4.1.2.1 General

All medications being taken by subjects were recorded. These medications were divided into 11 groups according to their mechanism of action. The number of subjects (frail and non-frail) taking medication is listed in Table 2. In none of the groups of medication was there any statistically significant difference between the number of frail and non-frail subjects.

7 (36.8%) frail and 2 (8%) non-frail subjects were taking an antidepressant, but numbers were too small to determine a statistically significant difference. Similarly for subjects taking regular analgesics, total number of frail patients was 9 (combining all forms of analgesics), and the total number of non-frail subjects was 2. Again the numbers were too small to demonstrate statistical significance.

	NUMBER FRAIL	NUMBER NON-FRAIL	SIGNIFICANCE ('p' value)
CNS-antidepressant	7	2	0.57
CNS-other	2	3	0.65
Analgesic-narcotic	1	0	0.65
Analgesic-combined	6	1	0.65
Analgesic-other	2	1	0.65
NSAID	9	6	0.09
Anticoagulant	8	10	0.09
CVS-antiarrythmic	6	5	0.09
CVS-antihypertensive	11	13	0.38
Bone protectors	2	9	0.20
Other	6	5	0.49

Table 2: Frail and non-frail subjects and the classes of medication being taken by each. Benzodiazepines are excluded (CNS = Central Nervous System; NSAID = Nonsteroidal Anti-inflammatory; CVS = Cardiovascular System).

4.1.2.2 Benzodiazepines

Table 3 lists all subjects, frail and non-frail, and the number taking benzodiazepines. Frail patients were much more likely to be taking a benzodiazepine (63%), than the non-frail subjects (28%). This difference is statistically significant ($p = 0.019$). There were no significant differences in the number of other medications taken by the 'benzodiazepine' subjects. In other words, taking a benzodiazepine did not make subjects more likely to be taking other medication (Table 4).

	BENZODIAZEPINE	NO BENZODIAZEPINE
Frail	12 (63%)	7 (37%)
Non-frail	7 (28%)	18 (72%)

Table 3: Number of subjects taking benzodiazepines compared with those who are not.

	BENZODIAZEPINE	NO BENZODIAZEPINE	SIGNIFICANCE ('p' value)
CNS-antidepressant	6	3	0.46
CNS-other	3	0	0.87
Analgesic-narcotic	0	1	0.87
Analgesic-combined	5	2	0.87
Analgesic-other	2	1	0.87
NSAID	9	6	0.66
Anticoagulant	7	11	0.66
CVS-antiarrythmic	7	4	0.66
CVS-antihypertensive	10	14	0.13
Bone protectors	3	8	0.18
Other	5	6	0.18

Table 4. Subjects taking or not taking benzodiazepines, and other classes of medication taken by each

4.1.3 Sleep

In order to assess subjects' perception of their own sleep pattern they were asked the following questions: Do you feel that you sleep well? How many hours do you sleep? Subjects were also asked if they woke during the night, and if so, how many times and did they go back to sleep easily (See Appendix I). Overall 70.5% (n = 31) of subjects reported that they slept well. This was independent of frail or non-frail status (p=0.35). Although 29.5% (n = 13) subjects reported sleep difficulties, most subjects (74%) slept for 6 – 8 hours, again, there was no difference between frail and non-frail subjects (p=0.79). 84% claimed to wake during the night, but most (72%) felt that this was not a problem. Very few subjects took sleeping aids other than benodiazepines (Table 5).

Of subjects who experienced sleep problems, 53.8% (n = 7) were taking benzodiazepines and 46.2% (n = 6) were not. Of subjects that were taking benzodiazepines 63.2% felt they slept well and 36.8% did not (Table 5; Figure 2). These differences were not statistically significant (p = 0.355). Interestingly, of subjects who felt that they slept well, 38.7% were taking benzodiazepines, and 61.3% were not.

BENZODIAZEPINE	SLEEP WELL (n = 31)	SLEEP POORLY (n = 13)
Subjects taking (n = 19)	63.2%	36.8%
Subjects not taking (n = 25)	76.0%	24.0%

Table 5: Percentage of subjects taking benzodiazepines and their perceptions of sleep.

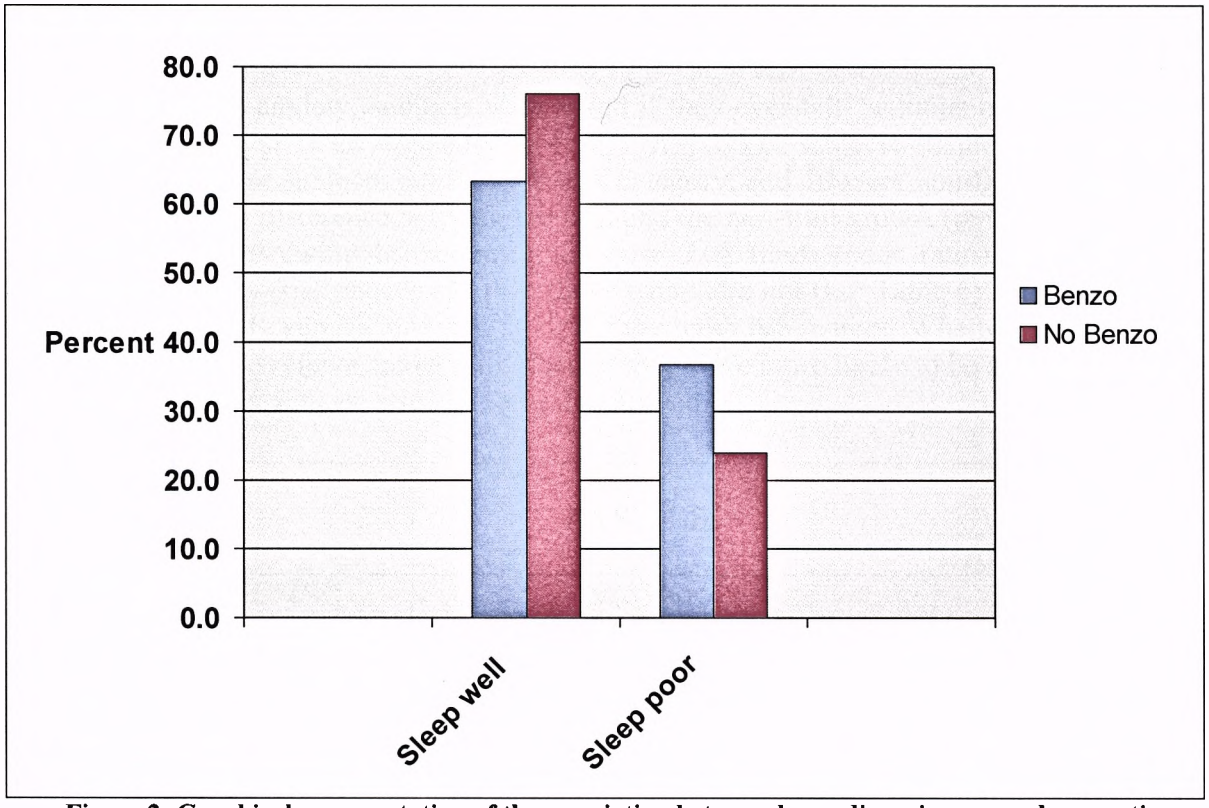


Figure 2: Graphical representation of the association between benzodiazepine use and perception of sleep quality.

Although there was no statistically significant difference in the perception of sleep quality between the subjects who took benzodiazepines and those who did not, one can certainly infer that subjects taking a benzodiazepine did not sleep any better than subjects who took no hypnotics.

4.1.4 Habits

About 48% of subjects drank alcohol, 55% of these were infrequent drinkers, i.e. did not drink daily. Again there was no significant difference between the frail and the non-frail subjects ($p = 0.51$), nor were benzodiazepine users more or less likely to drink alcohol ($p = 0.96$).

Only 2 residents smoked cigarettes, one frail and the other non-frail. Both of these subjects were benzodiazepine users, but again the numbers are too small to assess statistical significance accurately.

All subjects drank tea or coffee daily, therefore the consumption of these beverages was excluded as a confounding variable.

4.1.5 Anxiety

In order to assess anxiety, subjects were asked if they ever felt "anxious or worried about nothing in particular" (see Appendix I). 47.7% (n = 21) of subjects claimed to experience anxiety. 11 of these subjects fell into the frail category, and 10 were non-frail. Again there was no significant difference between the frail and the non-frail groups (p=0.24). However, patients who were taking benzodiazepines were 3.05 times (odds ratio) more likely to experience anxiety (risk ratio 1.75) than those who were not (see Table 6). This difference was not statistically significant (p = 0.07), but the trend is apparent. Whether subjects took benzodiazepines to relieve anxiety, or whether they were more likely to be anxious because they took benzodiazepines, remains to be determined.

	ANXIOUS	NOT ANXIOUS
BENZODIAZEPINE	12(63%)	7(37%)
NO BENZODIAZEPINE	9(36%)	16(64%)
FRAIL	11(52.4%)	8(34.8%)
NON-FRAIL	10(47.6%)	15(60.2%)

Table 6: Number of subjects who were anxious and association with Benzodiazepine use, and frail status.

4.1.6 Falls

61.4% of subjects had experienced one or more falls during the 5 years preceding this study. Frail subjects were not significantly more likely to fall than the non-frail subjects. 68.4% (n = 13) of frail subjects had falls, versus 56.0% (n = 14) non-frail subjects (p = 0.40). Falls in frail subjects were not as frequent as one would anticipate, probably because the frail tend to move around less and are very closely supervised.

Patients taking benzodiazepines were 4.06 times (odds ratio) more likely to fall, with a relative risk of 1.64, than those who were not taking benzodiazepines (Table 7; Figure 3). This difference is statistically significant (p = 0.036).

All those reporting falls had experienced significant injury, i.e. fractures. Multiple fracture sites were involved.

	FALLS	NO FALLS
BENZODIAZEPNE	15(79%)	4(21%)
NO BENZODIAZEPINE	12(48%)	13(52%)
FRAIL	13(68%)	6(32%)
NON-FRAIL	14(56%)	11(44%)

Table 7: Number of falls in subjects, and association with benzodiazepine use, and frail status.

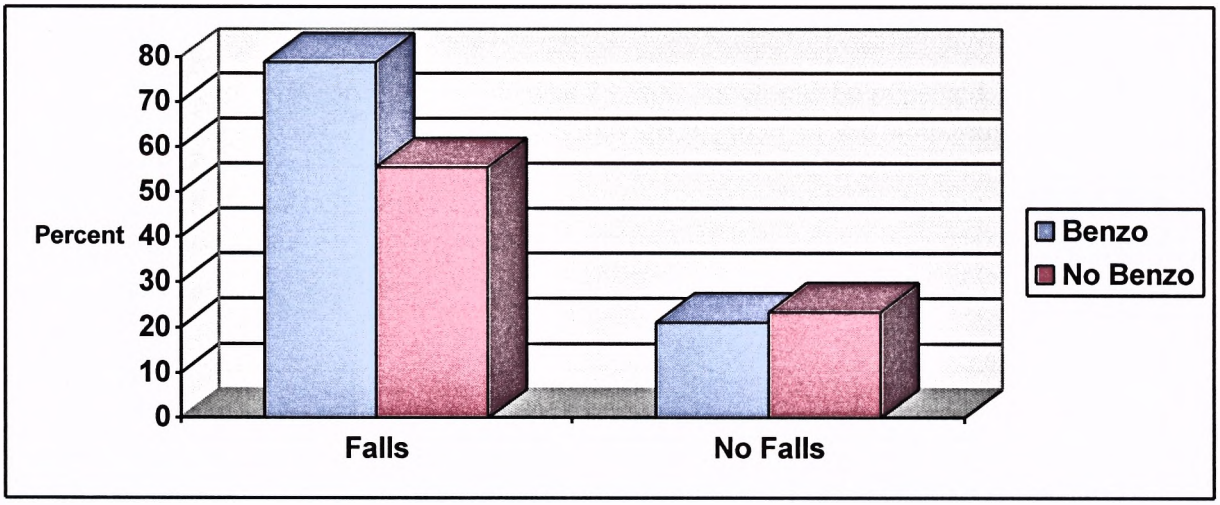


Figure 3: Percentage of subjects taking, or not taking benzodiazepines that suffered falls, compared to those that reported no falls.

4.1.7 Perceptions and Attitudes

As previously mentioned 43% (n = 19) of all subjects were taking benzodiazepines regularly.

The breakdown of the types of benzodiazepines was as follows: 68% short acting, 16% long acting, and 16% other (Zopiclone). 65% of subjects had been taking their benzodiazepine for at least 5 years, and the remaining 35% had taken them for 1 – 5 years. 84% took their tablet every night, and 11% at least several times a week.

Reasons for starting the benzodiazepine were often related to a traumatic event, an illness or hospitalization, and in one case a break-in. Some started taking them because their doctor had suggested it, but most (two-thirds) took them because of sleep difficulties. Reasons to continue taking the medication related to fear of not sleeping without them.

47% of subjects felt that their doctors were quite happy for them to continue taking the benzodiazepine, 32% were unsure of their doctor's opinion, and only 21% felt that their doctor would like them to stop taking their benzodiazepine. Most patients' (72%) benzodiazepine prescriptions were on long-term (6-12 months) renewal. 86% of subjects could not recall having consulted their doctor with regards to taking a sleeping tablet. When asked if they would like to stop taking the benzodiazepine, only 26% felt that they would. 37% had tried unsuccessfully to stop taking the benzodiazepine, and 95% believed that the tablet still helped them to sleep.

4.2 *Mini Mental State Examination*

The overall mean score on the MMSE was 25.568. As would be expected, MMSE scores were significantly lower (Table 8) in the frail group than in the non-frail subjects ($p = 0.0015$). In addition, the benzodiazepine group also scored significantly worse on the MMSE than the non-benzodiazepine group ($p = 0.04$) (Table 8; Figure 4). There is a statistically significant difference in the low scores of benzodiazepine users, compared to non-users.

	Minimum Score	25th centile	Median	75th centile	Maximum Score
Benzodiazepines	12	20	26	29	30
No benzodiazepines	11	27	29	29	30
Frail	11	17	23	29	30
Non-frail	21	27	29	29	30

Table 8: Scores on the MMSE in frail and non-frail subjects, and in subjects taking, or not taking benzodiazepines.

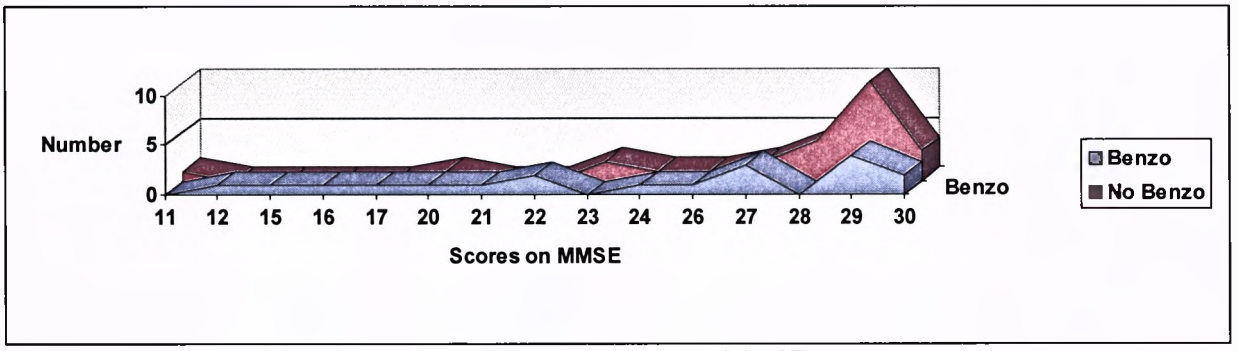


Figure 4: Association of benzodiazepine use with scores on the MMSE.

4.3 *Geriatric Depression Scale*

On the Geriatric Depression Scale, scores of 0 – 10 are viewed as being within the normal range, and scores of 11 or more are an indicator of depression.[43] Frail subjects scored significantly higher than their non-frail counterparts, as did subjects taking benzodiazepines compared with those who were not taking benzodiazepines. In other words, subjects who were taking benzodiazepines were significantly more depressed (Table 7; Figure 5). P value for the frail versus non-frail subjects was 0.007, and for the benzodiazepine versus the non-benzodiazepine subjects was 0.023. The differences between the benzodizepine and the non-benzodiazepine groups were seen in the extremes of the range, that is scores of less than 11, and greater than 20 (see Figure 5).

12 out of 19 frail patients, and 12 out of 19 patients taking benzodiazepines scored 11 or more on the GDS. That is, 63% of subjects in these groups were likely to be depressed.

	Number	Total Score	Mean	Significance
Frail	19	269	14.158	
Non-frail	25	211	8.440	p=0.007
Benzodiazepine	19	260	13.684	
No Benzodiazepine	25	220	8.800	p=0.23

Table 9: Scores on the Geriatric Depression Scale in frail and non-frail subjects, and in subjects taking or not taking benzodiazepines.

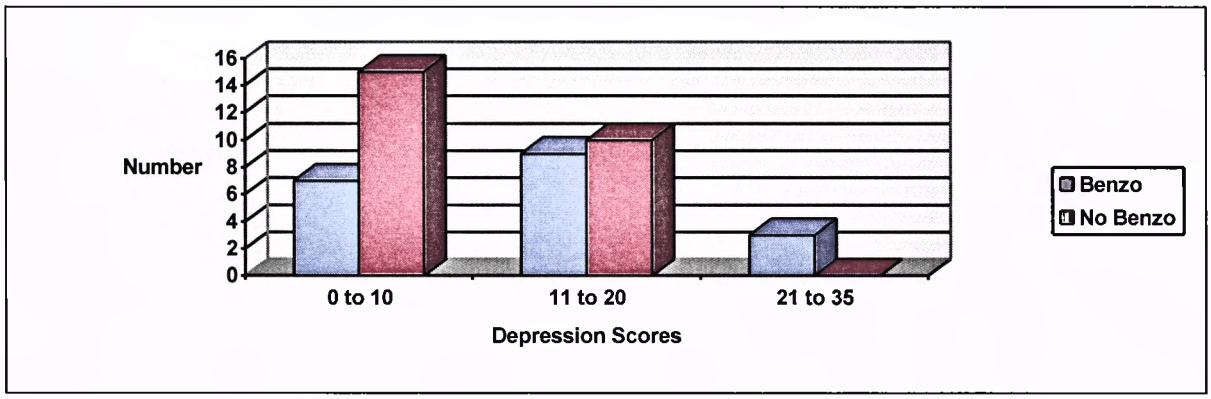


Figure 5: Depression scores in subjects taking benzodiazepines, compared with those who are not. Scores from 0 to 10 are within the normal range, and scores above 11 indicate depression. Scores greater than 20 are a marker of severe depression.

4.4 *Instrumental Activities of Daily Living*

By the very nature of residing in a frail care setting, these subjects obviously scored much lower on the IADL than did their independently dwelling counterparts. However, in the area of benzodiazepine use, the results showed a significant difference ($p = 0.0016$) between the subjects taking this medication, as compared to those who were not (Table10; Figure 6). Subjects not taking benzodiazepines scored significantly better on this scale.

	Number	Total Score	Mean	Variance	Standard Deviation
Benzodiazepine	19	143	7.526	13.930	3.732
No Benzodiazepine	25	277	11.080	10.743	3.278

Table 10: Score on IADL in subjects taking and not taking benzodiazepines.

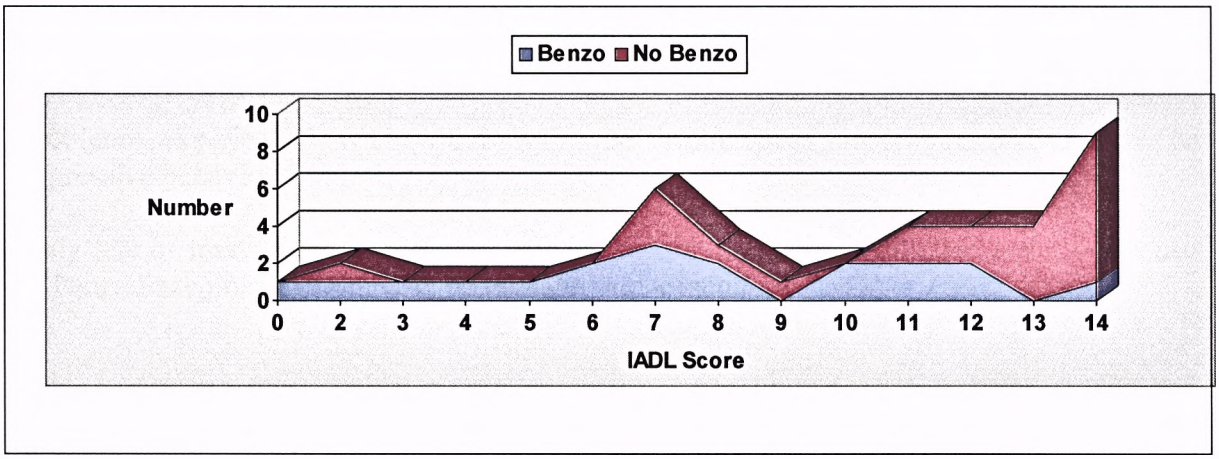


Figure 6: Scores for the IADL in subjects taking and not taking benzodiazepines.

4.5 *General Practitioner's Perception*

Ten doctors involved in treating patients resident at Rosehaven, were sent questionnaires. 100% replied. 55.5% felt that benzodiazepines were not safe to prescribe for the elderly, 33.3% felt that they were, and 11.2% were unsure. 66% believed that it was acceptable to allow an elderly patient to continue a benzodiazepine indefinitely, and 78% felt that a regular sleeping tablet was a good idea. 44.4% did not mind renewing prescriptions for benzodiazepines, while 33.3% did mind. 55.5% felt it was easier to renew the prescription, than to argue with the patient. 79% agreed that patients taking sleeping tablets would not be persuaded to give them up. 67% felt they were bothered by endless requests for benzodiazepine prescriptions.

Confusion was the most common problem associated with benzodiazepine use in the elderly, also disorientation and falls and depression. Symptoms of withdrawal most commonly observed were anxiety and insomnia.

General Practitioners were generally more suspicious of these medications than the Nursing staff. Many were 'unsure' of safety, and were also unsure of their feelings with regard to repeated prescription requests. Most disagreed that a regular sleeping tablet was a good idea for elderly patients. Unfortunately, the numbers are too small to determine any significance in these trends.

4.6 Nurse's Perception

Four trained nursing staff employed by Rosehaven completed the questionnaire. All of them felt that sleeping tablets and tranquillisers are safe for use in the elderly. 50% felt that a regular sleeping tablet was a good idea for the elderly and 50% were unsure. 75% felt it was not a problem to continue the sleeping tablet indefinitely. All subjects believed that it was better to tranquillise a restless patient that to allow them to disturb other patients. 75% believed that addiction to sleeping tablets was not important in elderly patients.

Problems experienced with withdrawal were restlessness, insomnia, and strange or aggressive behaviour.

Only one of four respondents expressed concern with regard to addiction and chronic use of benzodiazepines. All felt they were 'safe' and a 'good idea'.

5 DISCUSSION

5.1 The Benzodiazepine Controversy

The findings in this report highlight a common clinical dilemma: on the one hand an elderly patient who, although dependent on a benzodiazepine, finds it helpful, does not experience significant adverse effects, and refuses to discontinue the benzodiazepine, and on the other hand, the knowledge of the harmful effects of these drugs. Certainly during the process of interviewing these patients one cannot help but feel sympathetic to their cause. In spite of multiple reports in the literature of sedation and unsteadiness, increased falls[28] and automobile accidents in elderly subjects using these medications, one starts to wonder if the benefits do not possibly outweigh the complications.[30] Prescribed judiciously, psychotropic drugs can enhance the physical and psychological well being of the elderly. However, altered drug disposition makes this age group particularly sensitive to undesirable side effects, which can lead to a decline in mental and functional status.[11]

5.2 Methodology

A cross sectional analytical study is a descriptive study, and as such has inherent flaws. Particularly, it is difficult to assess the temporal relationship between exposure and the disease or problem.[45] For example, were subject more likely to be frail because they took benzodiazepines, or were they more likely to take benzodiazepines because they were frail? One can only determine a causal relationship with a prospective study, but these trials are expensive and are usually conducted over at least several years.

In order to obtain an equivalent number of frail and non-frail subjects, the latter were selected randomly for availability. This is a convenience sampling method, which may have led to bias in that more housebound people were interviewed, as more active residents were likelier to be out (refer to section 3.6). However, this would have closed the gap between frail and non-frail residents, decreasing the likelihood of significant differences.

The researcher administered all interviews and conducted all tests. This allows for consistency, but is open to interviewer bias. Subjects using benzodiazepines rely heavily on them and one felt sympathetic to their cause. Every attempt was made to analyse the data as objectively as possible.

In order to make best use of available time, and limit interviewer bias, the particular scales selected were very important. All three scales utilized have been thoroughly validated. The questionnaires to all subjects were not validated in this study, and they were also limited by the perceptions and memory of the person being interviewed.

The questionnaires completed by the Nurses, and the General Practitioners were not validated either. With hindsight one realizes that closed questions were used, and these cannot adequately address the subjective values of attitude and perception. They also neglected to cover respondents' knowledge. In addition, numbers were very small (five Nurses and ten General practitioners), which also limited useful analysis.

As the questionnaires were limited in their application, analysis of data tended to focus on the scales (MMSE, GDS and IADL) and the more objective aspects of the study.

The MMSE is a scale that assesses orientation, registration, attention and calculation, recall and language. It is scored from 1 to 30 as follows:
24 - 30 correct – intact cognitive function
20 - 23 correct – mild cognitive impairment
15 - 19 correct – moderate cognitive impairment
<15 correct -- severe cognitive impairment.[40]

The GDS is a screening tool appropriate for use in older patients. It avoids issues related to physical symptoms and asks questions requiring only a "yes" or "no" answer. One point is scored for each negative answer. The maximum score is 30, and a score of 11 or above is highly suggestive of depression.[10,42]

The IADL addresses the ability to perform daily tasks, including physical self-maintenance. The maximum score is 14 for fully functional individuals, and is a sliding scale reflecting the degree of care needed.[44]

As a result, one cannot be dogmatic about the findings of this study. However, it does provide enough indication that one should certainly be cautious with the prescription of benzodiazepines to the elderly population. In addition, it would certainly be of value to study the issue further.

5.3 Frail versus Non-frail status

5.3.1 Demography

Assessing the side effects of medications in elderly patients is fraught with difficulty as there are multiple confounding variables. Having the facility to compare frail and non-frail residents in the same setting at least eliminates some of these variables – for example, socio-cultural background, and financial status. This similarity is borne out by the demographic data: there was no significant difference in the sex, marital status or family support structure, of the two groups. There was also no significant difference in the number or type of non-benzodiazepine medications taken by these subject groups. There was also no significant difference in the age of the two groups.

The fact that the frail and non-frail groups were demographically similar, allows one to more confidently draw conclusions with regard to the influence of benzodiazepines.

5.3.2 Habits

Most patients experienced subjective sleep problems, regardless of frail or non-frail status. The rates of alcohol use and cigarette smoking were also the same in the two groups.

5.3.3 Benzodiazepine use

In a study carried out in Ontario, Canada, benzodiazepine use ranged from 22.5% in nursing homes (equivalent to frail-care facility) to 36.4% in retirement homes.[46] In the current study, this difference was even more marked, with 63% of frail and 28% of non-frail residents using benzodiazepines. The likelihood of taking a benzodiazepine was not associated with drinking alcohol or smoking cigarettes. Subjects who were not taking benzodiazepines were not more likely to experience sleep difficulties than those who were. Subjects that reported good sleeping habits, were in fact less likely to be taking a benzodiazepine. In summary no association could be drawn between a subjective feeling of sleeping well, and taking a benzodiazepine.

Anxiety was positively associated with benzodiazepine use, however it cannot be said that this is a causal association, as anxious patients are more likely to be taking a benzodiazepine.

Subjects using benzodiazepines were significantly more likely to have had a serious fall during the preceding 5 years than those who were not. Again one can only conclude that they are associated, and not that the benzodiazepine is the cause of the fall. Possibly functional problems, which make a subject more likely to fall, could also result in the subject experiencing more anxiety.

All subjects who had experienced falls reported that these falls resulted in significant injury. It is unlikely that all falls would result in fractures, thus subjects are probably not reporting falls that did not result in major injury. Whether this is because they had forgotten falls that did not result in injury, or whether they thought those falls were not significant is unknown. However, the incidence of falls is likely to be much higher than the number reported above.

5.4 Benzodiazepine classification

Short-acting benzodiazepines have been touted as safer for use in the elderly because their longer-acting counterparts are clearly associated with a higher risk of falls and a higher rate of injury after a fall. However Ray et al[28], in their study of falls in nursing homes, concluded that even the short elimination half-life agents are associated with a significant increase in the risk of falling in an elderly population. Zolpidem, although not a benzodiazepine, was included, because it produces similar psychomotor impairment.[28]

On the basis of the above findings, no distinction was made between the different classes of benzodiazepines, in this report.

5.5 Rating Scales

Subjects taking benzodiazepines scored significantly worse on all three scales utilized. In other words, taking a benzodiazepine meant the subject was less involved in the activities of daily living, was more likely to have dementia, and was more likely to be depressed. In the case of the MMSE, it was particularly in the lower score range that patients taking benzodiazepines were over represented. Whether this meant that once patients have dementia they are more likely to receive a benazodiazepine, or whether patients receiving a benzodiazepine were more likely to be demented, is uncertain. In order to determine this, one would need to conduct a prospective study. Certainly in the range of the higher scores, taking a benzodiazepine did not seem to effect mental functioning, as determined by the MMSE.

Interestingly, patients taking benzodiazepines were also significantly more depressed. This is especially so among the more depressed patients (highest scores). Understandably, subjects in the frail-care setting also scored higher on the depression scale. Once again, it is impossible to determine whether the benzodiazepines were prescribed as a result of the patients' depression, or whether they were the cause of the depression. This would depend on how frequently benzodiazepines are prescribed for depression, or alternatively the incidence of unrecognized depression in these patients.

Being frail is an extremely significant risk factor for depression, and is an important confounding variable in assessing the affect of benzodiazepines on depression. Although subjects taking benzodiazepines were significantly more likely to be depressed, we know that frail subjects were also more likely to be taking benzodiazepines. Perhaps, a study involving larger numbers, which would allow more detailed analysis, would elucidate this issue.

The situation, however, is complex as these drugs are prescribed for a multitude of reasons outside their official indications. Probably one of the most common reasons for their continued prescription is patient demand. In clinical practice one spends an inordinate amount of time persuading patients to take medications that they do not want to take, and on the other hand, trying, usually unsuccessfully to persuade them not to take medications like benzodiazepines.

Frail subjects also scored worse on the IADL than the non-frail subjects. This result would be expected, as poor functioning on IADL would be a major reason for admission to frail care. One would need to compare frail subjects who were or were not using a benzodiazepine against the variable of activities of daily living. This analysis could not be done due to small numbers.

Frail subjects were very significantly at risk for poor scores on all the rating scales. This limits the conclusions that can be drawn regarding benzodiazepines. Further studies more detailed studies are required to clarify this issue.

5.6 Withdrawal from Benzodiazepines

One of the major problems associated with patients stopping their benzodiazepines, are the most unpleasant side effects associated with withdrawal. The most problematic of these is the rebound insomnia, as the patients immediately assume that they will not be able to sleep without the medication.

It has been shown that a short-term programme for withdrawal of benzodiazepines is feasible in hospitalized geriatric patients.[47] However, clinical experience dictates that once patients are discharged from hospital, they will be clammering for their benzodiazepines again!

5.7 Care workers' perceptions

General practitioners caring for elderly, on the whole do not have strong feelings against the use of benzodiazepines in elderly patients. Problems associated with withdrawal, if one can get the patient's co-operation to stop their medication, seem to over-ride any concerns the prescriber might have. As a rule, there is little awareness of the side effects of benzodiazepines and problems associated with benzodiazepine use in elderly populations. Pressure from patients to receive their prescriptions is significant.

Nursing staff, are generally in favour of the use of benzodiazepines. Their perceptions are mainly guided by an emotional response rather than knowledge of the associated problems and complications.

5.8 Knowledge, attitude and perception of Benzodiazepine use

Subject knowledge of benzodiapines and their functioning, as well as complications of their use, is very limited. Subjects who were using benzodiazepines were particularly closed to discussion of their side effects. However, it must be said that this is a subjective opinion of the researcher, as the Subject questionnaire was limited by lack of questions to specifically determine knowledge of benzodiazepines, and side effects associated with their use.

The same can be said of the medical professional questionnaires, that is, the scope of the questions did not specifically address respondents' knowledge of benzodiazepines, and problems associated with their use.

Patients and care workers alike were generally in favour of benzodiazepine use. Nursing staff was particularly happy to use these medications.

5.9 Research question

The simple answer to this question is "yes". In other words, the use of benzodiazepines is detrimental to the health and well being of elderly residents at Rosehaven retirement village, and thus their use is likely to be detrimental to any elderly population.

The results of this trial indicate that physicians prescribing benzodiazepines to elderly people should at least use caution and careful consideration before initiating such treatment.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Aims

The aims of this study were met. Forty-four elderly subjects were included in this trial. The prevalence of benzodiazepine use in this population was established (n=19). Subjects who are using benzodiazepines believe in their usefulness, and do not wish to stop taking them. Medical personnel tend to have mixed feelings towards the prescription of these medications, although the nursing staff was generally in favour of their use. General Practitioners were generally unsure of the safety of these agents for elderly patients, or their feelings about repeated prescriptions. Most felt that regular sleeping tablets were 'not a good idea.

6.2 Objectives

The demographic features of subjects, resident in Rosehaven retirement village was determined. Some idea of the attitude of nursing staff and prescribing doctors was derived from self-administered questionnaires, although numbers were too small to determine statistical significance or consistency of response.

Subjects were interviewed and the frequency of benzodiazepine use (43%) established. Subjects who were using sedative hypnotics were reliant on them, but did not report better sleep quality or quantity than those who were not taking them.

Frail subjects were more likely to be using benzodiazepines than non-frail subjects. There was little consistency in subjects' perceptions of their doctor's attitude towards their sedative medication.

61.4% of subjects had fallen and all had been significantly injured (fractures). Falls not resulting in injury were probably forgotten.

All subjects were assessed with regards to functional ability, mental status and mood. Subjects using benzodiazepines were compared to those who were not, and frail and non-frail subjects were compared.

6.3 Summary of findings

This study has demonstrated that while the use of benzodiazepines is not associated with improved sleep, they are associated with a greater likelihood of falls in elderly subjects, irrespective of whether they live independently, or in a frail-care setting. In other words, benzodiazepines have a detrimental effect on the physical and mental status of subjects taking them.

As far as could be determined, this is also the first time the rating scales (IADL, MMSE and Geriatric depression scale) have been used to objectively assess the effect of

benzodiazepine usage on these functions. In all three scales the benzodiazepine subjects fared significantly worse.

Demographically, there were no significant differences between the group taking benzodiazepines and those who were not. Although, living in a frail-care setting was associated with an increased likelihood of taking a benzodiazepine, this was probably largely due to the influence of the nursing staff, who frequently exert pressure to sedate a patient who is restless and disruptive, particularly at night.

How then should one manage chronic insomnia in the elderly? Before starting any patient on a benzodiazepine, one should think very carefully, as all the evidence suggests that once patients, particularly elderly females, are taking benzodiazepines, they are unlikely to stop them. Try to manage the insomnia before resorting to medication. The cornerstone of insomnia management must be nonpharmacological methods. Teach sleep hygiene to the patient and his family.[48] Use simple rating scales such as the MMSE and the Geriatric Depression Scale to detect early dementia and/depression, and manage those.

Benzodiazepines are neither a panacea nor a curse. Indiscriminate prescription of these medications is inappropriate and unwise for patients of any age. As with any treatment, one must always weigh up benefit and harm. Perhaps legitimate therapeutic use is, at times obscured by issues of safety and dependence. In elderly patients, one can easily make a case for dependence being less important, but this study has once again demonstrated that safety issues are very real. However, despite their adverse effects, benzodiazepines remain effective pharmacological treatment for pure anxiety, and the anxiety associated with insomnia, one of the most prevalent forms of human suffering.

6.4 Recommendations

Benzodiazepine use was associated with cognitive, functional and depressive status decline in an elderly population. Further controlled trials are needed to determine a causal relationship.

Geriatric care is an underemphasized area of many medical curricula. Doctors and Nurses working with the elderly need to be aware of their special needs and vulnerablilites. I would like to suggest, that before prescribing a benzodiazepine for an elderly patient, physicians should carefully weigh the associated problems against the perceived benefits. Once a prescription has been issued, review it regularly. One must particularly consider the long-term effects of these medications, and bear in mind, that once a subject is taking one of these medications, they are unlikely to stop it. Wherever possible, determine the cause of the insomnia, and endeavor to treat it.

Long-term insomnia is more common in the elderly. It can be caused by psychiatric disorders, particularly depression and anxiety, and many medical disorders.[48] Depression was discovered in 63% of subjects interviewed for this study. Depression with associated insomnia would be better treated with a sedative antidepressant than with a hypnotic benzodiazepine. Consider also conditioned insomnia ("the harder they try, the less they sleep"). Elderly patients often require less sleep, thus time spent in sleep education,

perhaps teaching patients to mind less if they are not sleeping, is useful. Suggest alternative restful activities, for example reading.

As with so many other areas of medicine related to general practice, and in particular the care of the elderly, insomnia is a complicated problem, and the solution is time consuming and is not best 'solved with a pill'.

7 APPENDIX I

SUBJECT QUESTIONNAIRE

Age_____ Sex_____
Cottage/Frail Marital Status M/S/W/D
If married do you live with your spouse? YES/NO
Do you have close family living in Johannesburg? YES/NO
How regularly do you receive visitors not resident in Rosehaven?
Every week at least once/ fortnightly/ monthly/ less than once a month
Could you please show me all the medication that you are taking?

_____
_____
_____
_____

Do you feel that you sleep well? YES/NO
How many hours do you usually sleep? _____
Do you waken in the night? YES/NO
If YES
How many times? _____
Do you go back to sleep easily? _____
Do you waken in the night? YES/NO
Do you take or drink anything to help you to sleep?
If YES, what?_____
Do you drink alcohol? YES/NO
If YES how much per day_____
Per week_____
Do you smoke cigarettes? YES/NO
If YES how many?_____
How many cups of tea or coffee do you drink per day? _____
Do you ever feel anxious or worried about nothing in particular? YES/NO
If YES, how often do you have these feelings?
Several times a day/daily/more than once a week/weekly/seldom

Have you had any falls YES/NO
If yes, how many and how long ago? _____
_____
_____
_____

Were you injured? YES/NO
If yes, describe your injuries _____
_____
_____
_____

If no benzodiazepine on list:
Would you consider taking a medication to help you sleep or relax? YES/NO
If YES, what do you take?_____

Continue with this section only if benzodiazepine included in medication list
I see that you are taking_____,
the next set of questions is about this medication.
How long have you been taking X?_____
How regularly do you take X?
More than once a day/ every day/ several times a week/ once a week/ occasionally

Continue only if taken at least several times a week (more than once a week but not daily) for at least 6 months
Why did you first start taking these tablets? _____
_____
Why do you take them at the moment? _____
_____
What do you think your doctor thinks of these tablets? _____
_____
When did he/she last renew your prescription? _____
_____
How many repeats did he/she give you on your prescription? _____
When did you last see your doctor about this prescription? _____
Would you like to stop taking these tablets? YES/NO
Would your doctor like you to stop taking these tablets?
YES/NO/DON'T KNOW
Have you ever tried to stop taking them? YES/NO
If YES, what happened? _____
_____
Do these tablets still help you to sleep? YES/NO

8 APPENDIX II

MINI MENTAL STATE EXAMINATION[40]

	Possible Points
1 7. Tell patient *'I am going to say*	
b. What is this season?	1
c. What is this month?	1
d. What is the date?	1
e. What day of the week is this?	1
2. a. In which country are we?	1
b. In which province are we?	1
c. In which town or city are we?	1
d. In which hospital are we?	1
e. Which floor are we on?	1
3. Tell the patient *"I am going to say three words which I want you to remember"*. Then say (only once) *'apple, pen, table'*. Taking one second for each. Then ask patient to repeat all three. Then say *'Later I am going to ask you to repeat these words"*.	3
4. a. Say *'If you had 100 rand and spent seven rand what would you have left?* Then say *'Now take away seven rand again'*. Stop after five answers. Do not correct wrong answers.	
b. Ask patient *'Spell WORLD'*. Correct any errors and rehearse until patient spells correctly. Then ask patient *'Now spell WORLD backwards'*. (Score best of 4a or 4b). *(where y is the number of disqualified*	5
5. Ask patient *'Please repeat the three words that I asked you to remember'*.	3
6. Point to a pen and a watch. Ask patient to name them as you point.	2

	Possible Points
1. a. What is this year?	
something once and then I want you to repeat it'. Then say *'No ifs ands or buts'*. (Taking care to pronounce the final s's clearly.	1
8. Ask patient to follow this three-stage command. *'Take this paper in your right hand. Fold the paper in half. Put the paper on the floor'*.	3
9. Ask the patient to read and obey the instruction printed below. (Close your eyes).	1
10. Ask patient to write a sentence of own choice. (The sentence should contain a subject and a verb and be sensible. ignore spelling errors).	1
11. Ask patient to copy the design printed below. (All sides and angles should be preserved).	1
TOTAL SCORE	

SCORING

For a person with 7 years of schooling, good eyesight and hearing, a score of less than 24/30 is highly suggestive of dementia or delirium. Where illiteracy or eyesight is relevant the score is expressed as sx/30-y

questions and x the number of correct answers).

9 APPENDIX III

GERIATRIC DEPRESSION SCALE[42]

Mood Assessment Scale	
1. Are you basically satisfied with your life?	Yes/No
2. Have you dropped many of your interests? Yes/No	
3. Do you feel that your life is empty? Yes/No	
4. Do you often get bored?	Yes/No
5. Are you hopeful about the future? Yes/No	
6. Are you bothered by thoughts you can't get out of your head? Yes/No	
7. Are you in good spirits most of the time? Yes/No	
8. Are you afraid that something bad is going to happen? Yes/No	
9. Do you feel happy most of the time? Yes/No	
10. Do you often feel helpless? Yes/No	
11. Do you often get restless and fidgety? Yes/No	
12. Do you prefer to stay at home rather than going out and doing new things? Yes/No	
13. Do you frequently worry about the future? Yes/No	
14. Do you feel you have more problems with memory than most people? Yes/No	
15. Do you think it's wonderful to be alive now? Yes/No	
16. Do you often feel downhearted and blue?	Yes/No
17. Do you feel pretty worthless the way you are now? Yes/No	
18. Do you worry a lot about the past? Yes/No	
19. Do you find life very exciting? Yes/No	
20. Is it hard for you to get started on new projects? Yes/No	
21. Do you feel full of energy? Yes/No	
22. Do you feel that your situation is hopeless? Yes/No	
23. Do you think that most people are better off than you are? Yes/No	
24. Do you frequently get upset over little things?	Yes/No

25. Do you frequently feel like crying?
Yes/No
26. Do you have trouble concentrating?
Yes/No
27. Do you enjoy getting up in the mornings? Yes/No
28. Do you prefer to avoid social gatherings? Yes/No
29. Is it easy for you to make decisions?
Yes/No
30. Is your mind as clear as it used to be?
Yes/No

10 APPENDIX IV

INSTRUMENTAL ACTIVITIES OF DAILY LIVING

Ability to use telephone

Operates telephone on own initiative – looks up and dials numbers, etc. 1
Dials a few well known numbers 1
Answers telephone but does not dial 1
Does not use telephone at all. 0

B. Shopping

Takes care of all shopping needs independently
1
Shops independently for small purchases
0
Needs to be accompanied on any shopping trip 0
Completely unable to shop. 0

C. Food preparation

Plans, prepares and serves adequate meals independently 0
Prepares adequate meals if supplied with ingredients 0
Heats, serves and prepares meals, or prepares meals but does not maintain adequate diet 0
Needs to have meals prepared and served. 0

D. Housekeeping

Maintains house alone or with occasional assistance (e.g. "heavy work domestic help") 1
Performs light daily tasks such as dish-washing, bed making
1
Performs light daily tasks but cannot maintain acceptable level of cleanliness1
Needs help with all home maintenance tasks 1
Does not participate in any housekeeping tasks 1

PHYSICAL SELF MAINTENANCE SCALE

Toilet

Cares for self at toilet completely, no incontinence 1
Needs to be reminded, or needs help in cleaning self, or has rare (weekly at most) accidents 0
Soiling or wetting while asleep more than once a week
0
Soiling or wetting while awake more than once a week
0
No control of bowels or bladder 0

B. Feeding

Eats without assistance
1
Eats with minor assistance at meal times and/or with special preparation of food, or help in cleaning up after meals 0
Feeds self with minor assistance and is untidy
0
Requires extensive assistance for all meals
0
Completely unable to dress self and resists efforts of help from others 0

C. Dressing

Dresses, undresses, and selects clothes from own wardrobe 1
Dresses and undresses self with minor assistance 0
Needs moderate assistance in dressing or selection of clothes 0
Needs major assistance in dressing, but cooperates with efforts of others 0
Completely unable to dress self and resists efforts of others 0

E. Laundry
Does personal laundry completely 1
Launders small items – rinses stockings, etc.
1
All laundry must be done by others. 0

F. Mode of transportation
Travels independently on public transportation or drives own car 1
Arranges own travel via taxi, but does not otherwise use public transportation 1
Travels on public transportation when accompanied by another 1
Travel limited to taxi or automobile with assistance of another 0
Does not travel at all 0

G. Responsibility for own medications
Is responsible for taking medication in correct dosages at correct time 1
Takes responsibility if medication is prepared in advance in separate dosage
0
Is not capable of dispensing own medication
0

H. Ability to handle finances
Manages financial matters independently (budgets, writes cheques, pays rent, bills, goes to bank), collects and keeps track of income 1
Manages day-to-day purchases, but needs help with banking, major purchases etc. 1
Incapable of handling money.

D. Grooming
(neatness, hair, nails, hands, face, clothing)
Always neatly dressed, well-groomed, without assistance 1
Grooms self adequately with occasional minor assistance 0
Needs moderate and regular assistance or supervision in grooming 0
Needs total grooming care, but can remain well-groomed after help from others 0
Actively negates all efforts of others to maintain grooming 0

E. Physical ambulation
Goes around grounds or city 1
Ambulates within residence or about one block distant 0
Ambulates with assistance of (check one) a ( ) cane, b ( ) walker, c ( ) wheelchair ---- gets in and out without help or ---- needs help in getting in and out 0
Sits unsupported in chair or wheelchair but cannot propel self without help 0
Bedridden more than half the time 0

F. Bathing
Bathes self (tub, shower, sponge bath) without help 1
Bathes self with help in getting in and out of tub 0
Washes face and hands only, but cannot bathe rest of body 0
Does not wash self but is cooperative with those who bathe him 0
Does not wash self and resists efforts to keep him clean 0

11 APPENDIX V

DR MERYL LAMBSON

MSc(med),MBBCH

Dear Dr

I am currently a postgraduate student in Family Medicine at the University of the University of the Witwatersrand. As part of the requirements for the MfamMed degree, I am conducting a research project investigating perceptions of the long-term use of psychotropic drugs by elderly patients. The main objective of the research is to gain some understanding of – and insight into- the continual use of hypnotic and anxiolytic drugs.

The study involves an interview with each subject, and a comprehensive evaluation of the patient's cognitive and daily physical functioning. An assessment of depression will also be conducted. The study population will be all residents at Rosehaven retirement village, whether they are using psychotropic medication or not.

The purpose of this communication is to request your permission to include your patient resident at Rosehaven in this study. I have obtained a list of your patients from the management of the home. Please indicate your willingness, or otherwise, for each patient to be approached for inclusion in this study. If, to the best of your knowledge, any of these patients suffer from any of the following conditions, please exclude them from the study:
Patients taking benzodiazepines for reasons other than hypnosis or anxiolysis, e.g. epilepsy
Patients with severe hearing difficulties
Anyone suffering from a serious illness including severe dementia
Anyone currently in a personal crisis
At no point will your patients' management be altered or taken over by me.

I would also be most grateful if you would complete the brief questionnaire. This questionnaire relates to your attitude towards the long-term prescription of benzodiazepines in elderly patients. It should take no more than 10 minutes of your time to complete both sections of the questionnaire. Should you require it, I am happy to provide you with a short report detailing my findings as well as any relevant information pertaining to your particular patients.

Please return the completed documents to me in the enclosed stamped, addressed envelope as soon as possible.

Please rest assured that both your and your patient's confidentiality will be protected, and that participation in the study is completely voluntary.

Yours sincerely

MERYL LAMBSON

I give permission for my patients resident at Rosehaven retirement village to be approached for inclusion in the 'benzodiazepine study'. (Please ring the appropriate answer).

Mr/Mrs Xxxxxxxxxx YES/NO

Mr/Mrs Yyyyyyyyyy YES/NO

If you have answered NO for any of these patients, please describe you motivation briefly:

_____

_____

BENZODIAZEPINE STUDY

GENERAL PRACTITIONER'S QUESTIONNAIRE

Please circle you answers from 1 to 5, where 1 = strongly agree, 2 = agree, 3 = unsure, 4 = disagree, 5 = strongly disagree.

1. Benzodiazepines are safe to prescribe for the elderly 1 2 3 4 5

2. If a patient of 85 years living in an old aged home sleeps better with a benzodiazepine, it is O.K. to continue indefinitely 1 2 3 4 5

3. A regular sleeping tablet is a good idea for elderly patients 1 2 3 4 5

4. I don't mind renewing chronic prescriptions for hypnotics 1 2 3 4 5

5. It's easier to renew the benzodiazepine prescription than it is to argue with the patient 1 2 3 4 5

6. Patients taking sleeping tablets cannot be persuaded to give them up 1 2 3 4 5

7. I am bothered by endless requests for benzodiazepine prescriptions 1 2 3 4 5

What problems do you personally find with benzodiazepine use in the elderly?_____

_____

_____

_____

In your experience, what symptoms of withdrawal do patients complain of?

_____

_____

12 APPENDIX VI

DR MERYL LAMBSON

MSc(Med),MBBCh

Dear Sister Jenny

As you are aware, I am conducting a research project investigating the use of psychotropic drugs in Rosehaven village. I will be looking at the attitudes towards, and perceptions of these drugs of both patients and the medical staff caring for them. Your help and co-operation in enlisting subjects is greatly appreciated. I am asking you to do this to avoid residents feeling coerced into participation.

In addition, I would be most grateful if you, and all registered nurses on your staff, would complete the short questionnaire attached. Your input is greatly valued.

Please leave questionnaires in the enclosed envelopes in your duty room. I will collect them.

Yours Sincerely

MERYL LAMBSON

BENZODIAZEPINE STUDY

NURSING STAFF' QUESTIONNAIRE

Please circle your answers from 1 to 5, where 1 = strongly agree, 2 = agree, 3 = unsure, 4 = disagree, 5 = strongly disagree.

1. Sleeping tablets and tranquillisers are safe for use in the elderly 1 2 3 4 5

2 A regular sleeping tablet is a good idea for elderly patients 1 2 3 4 5

3 If a patient of 85 years, living in an old age home, sleeps better with a sleeping tablet, it is O.K. to continue indefinitely 1 2 3 4 5

4 It is preferable to tranquillise a restless patient that to allow them to disturb other residents. 1 2 3 4 5

5 Addiction to sleeping tablets or tranquillisers is not important in elderly patients 1 2 3 4 5

What problems have you personally found in patients withdrawn from their sleeping tablets or tranquillisers? _____

_____

_____

_____

_____

13 APPENDIX VII

DR MERYL LAMBSON

MSc(med),MBBCh

Dear Rosehaven Resident

Rosehaven has been selected as the venue for a research project looking at the use of sleeping tablets in a senior population. The main objective of the study is to gain some understanding and insight into continual use of prescribed sleeping tablets and tranquillisers.

The format of the study will be an individual interview with the researcher (Dr Meryl Lambson), followed by a brief assessment of your daily functioning. All that is asked of you is approximately one hour of your time.

The opinion of all Rosehaven residents is requested, whether you do or do not take medication to help you to sleep or relax. Permission has been requested from your own General Practitioner for you to participate in this study. Everything you say will be treated in the strictest confidence, and your name will not appear anywhere in any printed or published document. Your participation is completely voluntary and will in no way affect your status in this home or the health care relationship that you have with your doctor.

We feel that this is an interesting and important research study and therefore we, and the management of Rosehaven, have given our permission for the study to be conducted here.

If you do decide to participate in the study you will be free to withdraw at any stage should you change your mind.

We would be most grateful if you would indicate your willingness to participate, or otherwise, below.

I, _____, resident at cottage number_____/in the frail care section of Rosehaven, do/do not give my consent to be included in the research project into the use of sleeping tablets and tranquillisers by a senior population.

Signature_____Date_____

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