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A COMPARISON OF THE RELATIVE IMPACT OF A COGNITIVE-BEHAVIOURAL INTERVENTION CONSISTING OF AN EDUCATION COMPONENT, WITH A POSTAL EDUCATION PACKAGE, ON COPING WITH OSTEOPOROSIS

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**A COMPARISON OF THE RELATIVE IMPACT OF A COGNITIVE-
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COMPONENT, WITH A POSTAL EDUCATION PACKAGE, ON COPING WITH
OSTEOPOROSIS.**

by

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in partial fulfilment for the degree of

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ABSTRACT

A comparison of the relative impact of a cognitive-behavioural intervention consisting of an education component, with a postal education package, on coping with osteoporosis

Charlotte Davenport Clarke

A study was carried out in order to compare the effects of a cognitive-behavioural intervention, with a postal education package, on coping with osteoporosis. Thirty osteoporosis sufferers were divided into three groups. One group received an intervention programme consisting of education, relaxation techniques, and instruction in the use of coping strategies for pain and stress. A comparison group received an education booklet on osteoporosis sent to them through the postal system. The study also included a non-treatment control group. Measures of locus of control, depression, anxiety, pain, and disease knowledge, were taken pre-and post-intervention. It was predicted that the intervention group would report a significant decrease in external locus of control (sub-divided into chance happenings, and powerful doctor control beliefs), and an increase in internal locus of control, and in disease knowledge compared to the other two groups. A significant decrease in depression, anxiety, and pain ratings was also predicted for the intervention group compared to the comparison group and the control group. It was further predicted that there would be no relationship between the age of participants, and scores on any of the outcome measures.

Analyses of variance carried out on the data revealed significant differences between the groups from baseline to follow-up on some of the measures. Depression and pain ratings decreased significantly for the intervention group compared to the other two groups. Although anxiety also showed a trend to decrease for the intervention group, this result was not significant. Both internal locus of control and disease knowledge increased significantly for the intervention group compared to the other two groups. No significant differences were found post-intervention between the groups for external locus of control. Correlational analysis revealed no significant relationship between the age of participants and any of the dependent measures. These results suggest that education delivered on an individual basis as part of a cognitive behavioural-intervention is more effective in increasing disease knowledge than an education package sent to osteoporosis sufferers through the postal system. The results further suggest that adaptation to osteoporosis can be facilitated by equipping sufferers with a repertoire of cognitive-behavioural coping strategies, and that older adults are just as likely to benefit from such an approach as their younger counterparts. The results are discussed in relation to previous research findings, and suggestions for future research are put forward.

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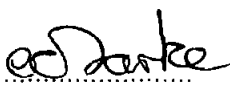
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Author's Declaration

At no time during the registration for the degree of Doctor of Clinical Psychology has the author been registered for any other University award.

The contents of this bound volume are identical to the volume submitted for temporary binding except for the amendments requested at the examination.

This study was conducted while the author was a Trainee Clinical Psychologist in the South West Region based in Cornwall and Isles of Scilly NHS Trust, and the research was conducted in collaboration with Cornwall Healthcare Trust.

Signed.....
Date.....2nd July 1997

INTRODUCTION

Osteoporosis is a metabolic bone disease which affects 1 in 3 women and 1 in 8 men. The disease is characterised by a decrease in bone density below the level required to maintain structural integrity of the skeleton. The result of this decrease in bone mass is increased risk of nontraumatic skeletal fractures.

Although osteoporosis is among the most preventable of diseases, more women die from the after-effects of osteoporotic fractures than from cancers of the ovaries, cervix, and womb put together. For both men and women, hip fractures are associated with a 20% mortality in the initial six months following fracture (Cummings et al 1985). Vertebral fractures are also associated with significantly increased mortality (Cooper et al 1993). The current yearly cost to the NHS of over 150,000 hip, wrist and vertebral fractures is at least £750 million (National Osteoporosis Society 1993). Despite this figure, no more than 1 per cent of people known to be at risk are ever given bone density measurement. The figures for men are unclear since research into osteoporosis in men is in its infancy due to a previous belief that only women were at risk. Current availability of, and access to, osteoporosis services remains variable in the UK and requires improvement.

Once diagnosed, the disease can now be treated with drugs such as bisphosphonates which arrest bone loss by slowing down the work of osteoclasts, therefore allowing osteoblasts to create new bone. Although such treatment can improve bone density and prevent further fracture, there is currently no cure for osteoporosis. Preventative measures include hormone replacement therapy, particularly for women (Lindsey et al 1976); regular weight

bearing exercise to help build bone mass (Shapira 1988); a calcium rich diet (Matkovic et al 1979), or calcium supplementation (Jensen et al, 1982; Riis et al, 1987). Risk factors include family history of the disease; alcohol consumption; cigarette smoking; certain medications (e.g. diuretics, steroids); certain other diseases (e.g. intestinal disease), over-exercising, or conversely, under-exercising; and over-dieting and weight loss. This list is not exhaustive, but gives an indication of what the individual themselves can do in order to reduce the risk of developing osteoporosis, or to minimise its effects.

Osteoporotic Fractures and Their Effects

The two most common, and perhaps least easily treatable, types of osteoporotic fracture are vertebral compression fractures and proximal femur fractures. Fifty per cent of sufferers who survive hip fracture do not return to their previous level of functioning. Since fractured vertebra never regain their normal shape, this may lead to a kyphotic posture, including dowager's hump, loss of height (up to 10 inches), both acute and chronic back pain; pain in the rib cage due to gradual vertebral collapse, and functional limitations (Lukert, 1982, Spencer, 1982). Vertebral compression fractures can limit the sufferers ability to perform activities of daily living, and restrict functioning in employment and social settings. Vertebral fracture can occur spontaneously as a result of minimal trauma, such as bending, reaching, or twisting.

The increased risk of fracture in osteoporosis means that many activities the sufferer once enjoyed are no longer realistically achievable. Chronic uncertainty regarding whether or not a spontaneous fracture will occur can result in sufferers severely limiting their social life for fear of being jostled in public places. For those with advanced osteoporosis, the risk of further spontaneous fracture can become a daily threat. Modifications in lifestyle can therefore become extreme, resulting in poor quality of life.

Acute pain lasting several weeks is typically associated with osteoporotic vertebral fractures (Patel et al, 1991). This acute pain can become chronic and may be associated with loss of height and vertebral deformity (Kanis & Pitt , 1992). Whilst mild vertebral deformity may not be associated with physical or psychosocial outcomes (Ettinger et al, 1988), many suffer from chronic pain and altered body image due to the loss of stature and progressive kyphosis (Kleerekoper & Nelson, 1992).

The prevalence of psychosocial problems in chronic diseases has been well documented (Mrosovsky & Powley, 1977; Lakoff & Scherr, 1984). Gold et al (1989) found multiple psychosocial problems in older adults with osteoporosis. The majority of research into osteoporosis has, however, neglected any examination of such phenomena (Cummings et al, 1985; Avioli, 1981). Cook et al (1993) examined the ways in which osteoporotic fractures affect the quality of life of the sufferer. The results showed that pain from osteoporosis has a profound effect on the lives of sufferers. Among the top five issues of concern to the women in the study were fear of falling and the fear of additional fractures. The authors concluded that fear appeared to be a function of the pain experienced with movement. The measurement of pain and disability may therefore be important in order to gain a full picture of the effects of any intervention on health-related quality of life (Cook et al, 1993).

Lyles (1993) found that psychosocial performance was limited in people with vertebral fracture, with increased pain, increased psychiatric symptoms, and greater perception of problems caused by health. Gold et al (1993) refers to the “invisible psychosocial wounds” of osteoporosis, and draws attention to the complexity of the psychosocial

consequences of the disease resulting from individual differences in responses to its negative consequences.

Pain

Pain can be described as a universal form of stress, and is a common feature of osteoporosis. The disease can give rise to two types of pain; acute, and chronic. Acute pain often follows a fracture, and may last a number of weeks before becoming manageable. Chronic pain in osteoporosis may be largely due to the postural changes (kyphosis) which can take place as a result of fracture. This is particularly the case with vertebral fractures which can result in the curved spine often seen in advanced osteoporosis.

Theories of Pain

Pain has been described as a complex, subjective experience that involves physical, perceptual, cognitive, emotional and spiritual factors (Bresler, 1992). The biomedical model has traditionally considered the experience of pain to be directly attributable to the amount of tissue damage. Specificity theory originated with Rene Descartes (1664) who put forward the notion of the existence of specific pathways, the responsibility of which is to transmit pain messages to a centre in the brain. This 'pain centre' is depicted as receiving signals, which themselves travel along specific nerve fibres with sensory endings devoted to recording only sensations of pain, rather than warmth, cold or touch. Specificity theory is based on Descartes assumption of a mind-body dualism, which designates pain as a bodily event, to which the mind reacts. The discovery that stimulation of free nerve endings was also capable of eliciting other sensations, has shown the specificity theory to be oversimplistic. The theory fails to adequately explain the complexity of pain. For example, pain can occur in the absence of injury, or when only light stimulus is applied.

Conversely, extremely serious injury can sometimes be accompanied by low self-reported pain, and few requests for medication, depending upon the meaning of the pain experience to the individual (Beecher 1946; 1959). In a study into the effects of placebo on pain experiences, Frank (1975) demonstrated that the effects of suggestion and expectancy are important factors in the reporting of pain. Phenomena such as phantom limb pain, and referred pain (in which the location of the pain differs from the location of the damage), are not accounted for by specificity theory. It fails to explain the existence of a defined group of elderly people with late onset osteoporosis who do not report high levels of pain, despite severe postural changes and vertebral fractures. Nor does it offer any explanation regarding why some osteoporosis sufferers experience acute pain immediately following fracture, but do not go on to suffer chronic pain as a result, whilst others continue to suffer long after the fracture has healed. The specificity model has been the major influence upon the use of medical and surgical interventions for chronic pain. However, cutting nerve pathways does not always result in cessation of pain sensation at the site of injury, and in some cases can make matters worse. The simplicity of this theory fails to adequately explain the differences between osteoporosis sufferers regarding reported pain. Nor does it offer any explanation for the differences within individuals regarding the relapsing and remitting course of osteoporosis-related pain.

In response to some of the problems of specificity theory, alternative theories of pain have been developed. Pattern theories, for example, relate the perception of pain to particular patterns of impulses in the nervous system. Originally published by Melzack and Wall (1965), the 'Gate Control Theory' represents an attempt to amalgamate already existing anatomical and psychological knowledge of pain, with more recent research findings in the area. The Gate Control theory states that there exists a gating mechanism in the dorsal horn of the spinal cord which allows pain to be reduced or modified at four points.¹⁾ The

peripheral site of the pain; 2) in the spinal cord 3) in the brain stem, and 4) in the cerebral cortex. The theory proposes that signals from peripheral sites of the body are transmitted to the spinal cord via electrical impulses travelling along small-diameter afferent nerve fibres. If the gate is open, these electrical impulses stimulate transmission cells in the spinal cord, which in turn send messages to the brain (the ascending pathway). Sensations of pain are received and recorded by the brain when the gate is open. Electrical signals emanating from the brain (the descending pathway) are capable of closing the gate.

According to Gate Control Theory, the release of nociceptive substances, and a decrease in accompanying muscle spasm can be achieved through the application of heat or cold, and local anaesthetics. In the spinal cord, large nerve fibres can be stimulated to interfere with transmission of pain impulses through the use of direct electrical stimulation, massage, and the application of heat or cold. Effective reduction or elimination of the transmission of pain impulses in the brain stem is possible using interventions such as electrical stimulation, acupuncture, and narcotic analgesics. Cognitive-behavioural techniques, including cognitive therapy, relaxation, imagery, music therapy, distraction, and hypnosis, work through action in the cerebral cortex (Donovan, 1989). Some of the techniques outlined above are recommended by the National Osteoporosis Society to its members in order to assist them in the management of osteoporosis-related pain.

Gate Control Theory has an important contribution to make to understanding the mechanisms by which psychological interventions for pain relief in osteoporosis may work. If the gate modifies the extent to which pain signals are transmitted to the brain, a closed gate could explain why some pains are not registered. The psychological, cultural, and physical environment may have a major influence on whether or not osteoporotic pain is experienced at any given time.

In its recognition of pain as a complex, multidimensional experience interrelating physical, psychological, and cognitive components, the Gate Control Theory provides a theoretical basis for the use of multimodal interventions for pain management in osteoporosis. Melzack (1973) made a distinction between the sensory and affective components of the pain experience. Other writers have pointed to the additional role of activity in physiological and behavioural systems as key components in the subjective experience of pain (Fordyce 1978; Pearce, 1986). It is Fordyce's (1978) contention that perception of activity in the physiological system is experienced on a subjective level, both as a sensation and as unpleasant affect. Attempts to communicate the pain experience to others, and to reduce the intensity of the experience, is motivated by this negative affect. Variations may occur between physiological, subjective, and behavioural systems. Karoly (1985) extended this 'three systems' model to include both lifestyle factors, and information processing or central control (e.g. coping styles, problem-solving skills, and health beliefs). Karoly emphasises the equal importance of all the different components in the experience of pain, referring to them as 'response levels'. He challenges the assumption, made by previous models, that psychological factors modulate physiological input through an interaction between the two. Karoly contends that, even if all sensory afferent input is blocked, it is possible for pain to be experienced. A major restriction of Karoly's model is that it is purely descriptive, and therefore has no prescriptive power. Its usefulness lies in its ability to describe in an abstract manner the possible existence of a feedback loop between different levels of pain.

A model outlined by Phillips (1987a) describes the influence of cognitions on pain behaviour. The pain sufferers' expectations regarding the effects of their actions, together with their own ability to control episodes of pain, are considered to be important factors.

Avoidance of activities that might provoke pain can be the result of low self-efficacy. According to this view, pain behaviour is avoidance behaviour which serves to maintain the original pain problem. The picture is, however, rather more complex with osteoporosis sufferers, who may avoid certain activities because of fear of further fracture, and not necessarily because such activities might provoke pain. Since the threat of fracture is often very real, and neither imagined nor exaggerated, avoidance of certain activities is necessary and advisable. The unique set of problems associated with osteoporosis may mean that it is fundamentally distinct from other chronic pain conditions. Some theories of pain may therefore not be useful in the understanding of osteoporosis sufferers

Leventhal (1984) developed a model which has greater predictive power than that put forward by Karoly. Some similarities can be found between the two models, in that neither attributes a primary role to nociception in the pain experience. Where Leventhal's theory departs from Karoly's is in its emphasis on an information-processing theory of emotion which states that central processing occurs at three levels organised hierarchically. At the first level, environmental stimuli activate expressive motor reactions that are said to be innate. This leads to a second level in which the emotional experience is encoded in memory. A schematic system then gradually develops, in which the affective and expressive motor responses to the stimulus are recorded (Leventhal 1984). According to this theory, the experience of pain can occur in the absence of physical pathology, and in response to environmental stimuli alone. The theory therefore represents an attempt to provide an explanation for the phenomenon of pain experience in the absence of any detectable physical pathology. However, it could also be the case that some form of physical pathology is present, but medicine has not yet progressed sufficiently far enough to be capable of detecting all disorders. For example, osteoporosis often remains undetected for years due to inaccessibility to diagnostic equipment and the inability of

Xray methods to ascertain levels of bone density, or to detect fine, hairline fractures. Although osteoporosis, it is claimed, is typically silent until a fracture occurs, many sufferers have been experiencing pain for years before eventually being diagnosed. It may therefore be too premature to draw any firm conclusions regarding the underlying reasons for reported pain when physical pathology appears not to be present. Goudsmit and Gadd (1991) urge caution regarding the possible psychologisation of reported symptoms in the absence of any clear physical disorder.

Psychological Interventions for Chronic Pain

Operant Techniques

The use of operant conditioning in the treatment of chronic pain has been proposed by Fordyce (1976). This approach involves the manipulation of the consequences that are considered to act as reinforcers for pain behaviour. Such reinforcement can be either positive or negative. The goal of therapy is therefore to increase well behaviours and decrease pain behaviours. This is achieved by ignoring verbal and non-verbal expressions of pain, and using positive reinforcers to reward well behaviours (e.g. medication reduction, increased activity levels). The patient's thoughts, feelings, and other cognitive events are deliberately ignored, since attending to such factors may reinforce pain behaviours. This approach can be criticised for its neglect of intrapsychic factors which have an important role in the experience of osteoporotic pain.

The lack of methodological rigour in outcome studies prevents any firm conclusions regarding the efficacy of operant methods for chronic pain. A study conducted by Fordyce et al (1973) used the operant approach with 36 chronic pain patients over a 5 year period. Participants received inpatient treatment for between 4 and 12 weeks, followed by 0 to 24 weeks of outpatient treatment. The spouses of the participants were given individual

counselling regarding how to ignore pain behaviour and reinforce non-pain behaviour. Significantly less pain was reported at follow-up. Reduced interference with daily activities, reduction in medication, and reduction in pain-related resting time were also reported. The wide variations in treatment and follow-up times represent a major methodological flaw. The lack of appropriate control in this study seriously limits the generalisability of the findings. A review of the literature by Linton (1986) concludes that, whilst operant programmes have been found to increase activity and decrease medication, reductions in ratings of pain intensity are less reliable.

The inclusion of additional therapeutic approaches in other outcome studies of operant conditioning have similarly confounded results. For example, biofeedback and relaxation techniques were included in a study by Cinciripini and Floreen (1982). This study also omitted to include control conditions, therefore rendering the interpretation of the results inconclusive. A study by Sanders (1983) employed a multiple baseline single case design to demonstrate that the greatest overall improvement was achieved by preceding an operant activity programme with relaxation training. Similar findings have been reported by Seres and Newman (1976) who included operant conditioning, physiotherapy, biofeedback, relaxation, and education in the treatment programme. The methodological flaws in such studies prevent any categorical statement regarding which psychological treatment or combination of treatments is most likely to benefit the pain patient.

Cognitive Methods

The way in which people adapt to chronic pain and illness is affected by cognitive processes and events. Environmental and biological factors also have a contributing role. Interventions that attempt to influence pain through the use of the individual's thoughts and cognitions come under the heading of cognitive therapy (Edgar, & Smith-Hanrahan, 1992). Chronic pain can be accompanied by emotional and behavioural symptoms, including depression, anxiety, anger, avoidance of activity, substance abuse, and family discord. The way in which the individual perceives and subsequently responds to pain is influenced by their cognitive appraisal of the pain situation. Many of the problems associated with pain have been linked to ineffective methods of coping (Ciccone & Grzesiak, 1988).

Two broad categories exist for treating chronic pain on a cognitive level. The main focus of cognitive restructuring is the modification of maladaptive thoughts and appraisals associated with the experience of pain. This approach originates from the work of Beck et al (1979) and Ellis (1958), and assumes that maladaptive thoughts, attitudes, and beliefs are associated with poor adjustment to chronic pain. The aim of therapy is to reduce the maladaptive self-talk that has been found to be associated with negative affect (e.g. catastrophising, overgeneralising, personalising), and to increase the individual's beliefs regarding their ability to control pain. The reduction of fear/avoidance beliefs is a further therapeutic goal. Cognitive skills training is the second cognitive approach used in the management of chronic pain. The approach attempts to enhance adaptive coping by teaching the pain sufferer specific cognitive techniques such as attention diversion, relaxation, imagery, and relabelling methods. Turk and Genest (1979) categorised pain

copied strategies into imaginative inattention; transformation of context; imaginative transformation; attention diversion; and somatisation. Pearce and Erskine (1989) emphasised the importance of allowing strategies to be individually developed in practice, rather than rigidly adhering to a particular classification system.

A study by Puder (1988) demonstrated that a ten week training programme incorporating cognitive therapy was capable of reducing medication use, increasing the ability of individuals to cope with pain, and decreasing the extent to which pain interfered with daily living. Puder found no relationship between age and outcome, which led to the conclusion that cognitive therapy can be used for all age groups. Other studies which evaluated the effects of cognitive treatments for rheumatoid arthritis have found improvements in psychological functioning, functional status, and confidence in personal ability to manage pain (Parker et al 1988; O'Leary et al 1988). Helme and Katz (1993) noted that substantial evidence exists that a systematic programme of cognitive interventions is capable of identifying and changing maladaptive thoughts, which in turn influence the degree of psychological, social, and physical impairment.

Turk (1994) has made the observation that people who feel they have a good repertoire of pain coping skills tend to suffer less than those who feel helpless and hopeless. Positive adjustment to chronic pain has been demonstrated in approaches using self-instructional methods (Turk, Meichenbaum & Genest, 1983; Jensen & Karoly, 1991). It has been pointed out by Spence (1994) that an important component of pain management programmes should be to teach individuals how to use cues to employ coping strategies, to reduce negative self-talk, and improve their ability to remain relaxed when confronted by pain.

Many therapy programmes for chronic pain sufferers employ cognitive techniques as a major component. Evidence for the effectiveness of combining cognitive and behavioural methods in pain management programmes has been demonstrated by a number of studies (Nicholas, Wilson, & Goyen, 1992). The cognitive-behavioural approach acknowledges the multidimensional aspects of pain, and can therefore be seen to be compatible with the Gate Control Theory (Melzack and Wall 1965). Research by Spence (1991) achieved significant reductions in depression, pain perceptions, disability, distress, and interference in daily living, by using a cognitive-behavioural approach on either a group or individual basis. Participants in this study also began using a more active, rather than passive coping style, but tended to revert back to using passive coping strategies at two year follow-up. One problem with this, and other multi-component approaches, is the difficulty in determining the contribution made by the cognitive therapy component to the effectiveness of the treatment package. An attempt to clarify this matter was made by Jensen (1993) who found that cognitive therapy and relaxation training were equally effective whether used separately or in combination. Both approaches resulted in a reduction in depression, disability, pain behaviour, and pain, and these improvements were maintained at 12 month follow-up.

The possible mechanisms involved in therapeutic improvements in adjustment to chronic pain have come under scrutiny. This attention results from the suggestion that the different treatment approaches appear not to differ greatly in their effectiveness (Anderson, Lawrence, & Olsen, 1981; Nicholas, Wilson & Goyen, 1991; Spence, 1992; Turner & Jensen, 1993). Research by Holroyd et al (1984) involving biofeedback training found that reduction in pain was related to expectancy of success, increased self-efficacy, and internal locus of control. A more recent study by Spence (1992) found that biofeedback and relaxation training resulted in modifications in thoughts, beliefs, and attitudes, in the

absence of cognitive therapy. Increased employment of active coping strategies, together with reductions in depression, anxiety, distress, and interference with daily living were also noted in this study. Such findings suggest that perceived control may be the most important influencing factor in adjustment to chronic pain. Spence (1993) concludes that cognitive therapy should aim to equip the pain sufferer with a repertoire of coping strategies, and provide education regarding the most appropriate strategy to use in response to the level of pain being experienced. Empowering the client with the confidence to employ the learned techniques is of equal importance. Enhancing sense of self-control could be the key factor which enables the sufferer to feel more able to cope with pain sensations, and hence less helpless. It is Kavanagh's (1995) contention that the aim of therapy should be to end the passive role of the dependent pain sufferer by increasing self-perceived control over pain. Such an approach may therefore be of particular benefit to osteoporosis sufferers who realistically lack control over the progression of the disorder, but may be taught to gain control over its associated difficulties.

Older Adults with Chronic Pain

The effectiveness of multidisciplinary treatment programmes for chronic pain sufferers has grown in recent years. Success rates of between 60 and 70% have been reported in such programmes which use both physical and psychological approaches (Guck, Skultety, Meilman & Dowd, 1985; Painter, Seres & Newman, 1980). Unfortunately, older adults are seldom referred or admitted to these programmes, despite a growing increase in their availability. Since the risk of developing osteoporosis increases with age, older adults are more likely to need to be included in programmes which are capable of assisting them to manage osteoporosis-related pain.

Research by Blazer & Williams (1980) found that “substantial depressive symptomatology” existed in over 15% of a stratified subgroup of older adults, and in nearly half of these cases, depressive symptoms were linked to chronic illness. The relationship between chronic illness and depression is stronger for older adults than for those in a younger age group. A study which looked at 228 people over the age of 55, found that physical illness, functional disability, and chronic pain were correlated with depression (Williamson & Schulz 1992). The perceived impact of pain on social, recreational, family, and occupational activities, along with perceived control over life, has been found to significantly mediate the relationship between pain and depression (Rudy, Kerns, & Turk 1988). However, a replication of these findings by Turk, Okifuji, & Scharff (1993) found that the relationship between pain and depression was only significant for older patients, and not for those in a younger age group. One possible explanation for these findings is that, in addition to pain, depression is also profoundly affected by the reduction in activities often experienced by older adults. Some gender differences may also exist regarding the relationship between pain and depression. Depression in men has been found to be more associated with loss of activity than with pain severity, whilst a significant correlation between pain severity and depression was found for women (Haley, Turner, and Romano, 1985).

Older adults are under-represented in pain clinics (Melding 1991), despite being more likely than younger people to suffer from chronic pain conditions such as osteoporosis (Crook et al, 1984; Lavsky-Shulan et al, 1985). A meta-analysis by Flor, Fydrich & Turk (1992) evaluated the efficacy of pain clinics, and found that none of the 3,000 patients studied were over the age of sixty-five. The reasons for older adults not being referred for pain management remain unclear. Turk et al (1994) suggest a number of explanations, including the possible existence of clinician bias with regard to the older adults need, or

ability to benefit from a programme. The authors also cite the popular myth that pain is a natural part of the ageing process, and therefore requires no treatment. A third possible reason put forward by Turk et al (1994) is that a half-hearted examination and treatment for older adults may result from a common misconception that older people tend to exaggerate when reporting pain. This has not, however, been found to be the case (Eckstein 1978). Older adults may, in fact, under-report pain because they have been led to believe that it is a normal part of ageing, and must therefore be tolerated.

Several studies have demonstrated that there are no valid reasons for older adults to be excluded from pain clinics (Middaugh et al 1988; Puder, 1988). A number of researchers have reported that the older adult's ability to learn effective pain coping strategies is no different than that of younger sufferers (Coenda & Dougherty, 1990; Keefe & Williams 1990). Sorkin et al (1990) found that older adults are equally likely to use nonpharmacologic techniques for pain relief (e.g. TENS, heat, massage), but less likely than younger sufferers to employ cognitive-behavioural techniques such as relaxation, imagery, or distraction. The same study did, however, find no differences between younger and older clients in their willingness to attend and accept multimodal treatments focusing on cognitive-behavioural approaches in addition to non-pharmacologic physical treatments. Older adults have been found to be more interested, co-operative, and willing to work hard for small gains, when compared with their younger counterparts (Middaugh et al 1988). These research findings suggest that those older adults who suffer from osteoporotic pain would benefit from a cognitive-behavioural approach to its management.

Relaxation Therapy

Relaxation therapy is a cognitive-behavioural technique which has been found to be useful in the management of chronic pain (Linton 1986). The experience of chronic pain can be

an extremely stressful one for the sufferer. The primary assumption of the psychophysiological model is that pain is associated with stress through the cycle of interactive events that occur with chronic pain. Autonomic and muscular responses associated with pain sensations often lead to stress reactions. Ross, Keefe & Gil, (1988); and McCaffery & Beebe, (1989), have noted that pain sensations can cause or aggravate muscle spasms, constriction of blood vessels (leading to decreased blood flow to tissues) and the secretion of pain-producing substances which cause, or augment, existing pain. The stress response is further exacerbated by the sufferers' emotional reaction, which can then result in a cycle of events which include pain, anxiety, muscle tension, and increased pain (Ross & Keefe 1988). By interrupting this cycle, relaxation techniques are capable of modulating pain perceptions by reducing anxiety and lessening the degree of muscle spasm. Added benefits include the improvement of pain-related sleep problems, decreased fatigue, enhanced perception of control over the pain, and enhanced mood (Haley & Dolce 1986; McCaffery & Beebe, 1989). Relaxation techniques enable individuals to cope with the symptoms of the stress response to pain. Once the ability to recognise the symptoms of stress and tension has been achieved, it is possible to gain a greater sense of control over them by using breathing techniques and the relaxation response. Relaxation is a coping strategy which enables individuals to function more efficiently, and to feel that they control the pain, and not the converse. This approach may therefore be of particular benefit to osteoporosis sufferers who, in addition to suffering chronic pain, may also experience anxiety evoked by fear of further fracture.

A study by Philips (1988) which looked at the effects of relaxation training in pain clinics found a significant reduction in sensory and affective pain dimensions and pain intensity. A further study by Strong (1991) used the McGill Pain Questionnaire (MPQ) to monitor progress during relaxation training. The results showed a decrease in all aspects of pain

measured by the MPQ. However, the only results that were maintained at follow-up were for sensory pain and pain intensity. These findings suggest that refresher courses of relaxation training may be required at certain time intervals. An evaluation of relaxation techniques by Keable (1985); and Clarke, Allard & Baybrooks (1987), found that relaxation techniques can help rheumatoid arthritis sufferers more than drugs and physiotherapy. Jackson (1991) states that the best results are obtained when relaxation is taught in combination with exercise techniques and education.

Available relaxation interventions include progressive muscle relaxation; passive muscle relaxation; autogenic training; biofeedback; meditation, and hypnosis.

Progressive Muscle Relaxation

Progressive muscle relaxation (PMR) originally developed by Jacobsen (1938) involves the alternate tension and release of large muscle groups in a progressive fashion. The client is taught to attend to the different sensations associated with tension and relaxation (Bernstein & Borkovek 1973). Ability to recognise and control tension levels can be achieved through the use of PMR. There are, however, some clients for whom this approach may be contraindicated. For example, pain associated with orthopaedic injuries to the neck and back may be exacerbated by PMR (Scandrett & Vecker, 1992; Snyder, 1992). The increased risk of spontaneous fracture in osteoporosis is a factor which makes the use of PMR for this group inadvisable.

Passive Muscle Relaxation

Passive muscle relaxation is a gentler technique which may be used as an alternative when PMR is inappropriate. Some clients may experience an increase in pain as a result of PMR. Others may feel uncomfortable with the increased tension experienced when using this

technique. Passive muscle relaxation does not involve the active contraction of muscle groups, and may therefore be more appropriate for older adults, and for people suffering from osteoporosis.

Autogenic Training

Autogenic training for the management of chronic pain is an alternative relaxation technique described by Schultz & Luthe, (1969). Suggestions of heaviness made to the client have been found to correlate with relaxation of muscles. Warmth is associated with a psychophysiological perception of the vasodilation of the peripheral vessels (Schultz & Luthe, 1969). Relaxation and pain reduction is achieved by increased blood flow to the extremities, and increased sense of warmth and heaviness (Catalano, 1987). Like passive muscle relaxation, this technique may be useful for osteoporosis sufferers and for older adults.

Imagery

Visual imagery refers to a technique which involves the creation of mental pictures by using the imagination. Research by Bresler (1979) and Simonton & Simonton (1979) has shown that guided imagery can be effective in reducing chronic pain. Effective use of the technique is largely dependent upon the individual's ability to fantasise (LeBaron, 1989). Some researchers have suggested that the individual experiencing the pain should decide upon the particular image to be used (LeBaron, 1989; Simonton & Simonton, 1974). Chronic low back pain has been found to be reduced to a greater extent by other-guided imagery than by self-guided imagery, although both approaches result in a reduction. The research therefore suggests that a tape recording containing imagery techniques produced by someone else, but tailored according to the individual's preferred images, may be a useful technique to use for chronic pain sufferers.

Distraction

Distraction is a cognitive technique which involves diversion of attention to take the mind off pain. Research by Long & Johnson (1978) found that distraction can effectively reduce anxiety. Pain has been found to decrease as a result of attention diversion (Donovan, 1982). Cognitive distraction strategies have been found to be capable of diminishing the perception of pain (Rosensteil & Keefe, 1983). Simple techniques include listening to music, watching television, reading, or engaging in some other pleasant pursuit. Talking, stroking an animal, or playing with a child have also been found to be effective distraction techniques (Donovan, 1982). It has been recommended by McCaffery and Beebe (1989) that the boredom associated with disability caused by chronic pain can be alleviated through the use of structured distraction techniques. Osteoporosis sufferers are often disabled, not just by pain, but by postural changes and fracture risk. Distraction techniques may therefore be an effective coping strategy which sufferers can use to take their mind off pain and disability, and alleviate the boredom associated with reduced activity levels imposed by the disorder.

Locus of Control and Illness

Extensive research has been conducted into the concept of locus of control. The concept was first put forward by Rotter (1966) who distinguished between internal and external locus of control. An individual who believes in their own personal responsibility for events is said to have an internal locus of control, whereas an external locus of control is characterised by a belief that people or factors beyond personal control are responsible for events. Although it was Rotter's (1966) contention that either extreme was pathological, much of the early research tended to dichotomise individuals into either 'internals' or 'externals'. Other locus of control investigators have argued that internal versus external

control is not a unidimensional construct (Collins, 1974; Mirels, 1970). Levenson & Miller (1976) have subdivided external locus of control into beliefs that powerful others control events, and beliefs that events are controlled by luck or chance happenings. These bipolar and multidimensional models have been adapted to create health locus of control scales (Wallston et al, 1976, 1978). A standardised scale to measure beliefs about controlling pain was devised by Skevington (1990). Three subscales were included to assess 1) beliefs in the internal or personal control of pain, 2) beliefs that powerful others, namely doctors, control pain, and 3) beliefs that pain is controlled by chance events. The Beliefs about Pain Control Questionnaire (BPCQ) was designed specifically for use with physically ill, and non-psychiatric populations in mind. It avoids the necessity to adapt inappropriate scales, standardised on psychiatric patients, in order to assess the physically ill. It is therefore an appropriate instrument for assessing locus of control in osteoporosis sufferers.

The association between locus of control and physical variables (such as sports fitness, general health, and a variety of physical disorders) have been examined by several investigators. Folkins & Sime (1981) reviewed the literature on physical fitness and health, and their relationship to personality in general. Several of the studies reviewed looked specifically at locus of control. One study found that children in a sports fitness camp became more internal as a result of their experiences, and these gains were maintained at two year follow-up when compared with controls. Internality has also been linked to better athletic performance (Morris, Vaccaro, and Clarke, 1979), with swimmers (Kaufman, 1975), soccer players (Johnson, Duke, and Nowicki, 1980), and childrens' development of specific physical skills (Ulrey 1974).

A number of physical problems, and sufferers' reactions to them, have also been linked to locus of control. A study by Chapman & Jeffrey (1979) found that people with an external

locus of control tended to be less successful in weight loss programs. Similar findings have been reported for smoking behaviour (Williams, 1993), and diabetes control (Kubel, 1976). A positive correlation between externality and high scores on the Impact of Sickness Inventory was reported by White (1981).

There appears to be a relationship between locus of control and the extent to which individuals take responsibility for, and become involved in, their own treatment programmes. Kubel (1976) reported that internal diabetic children were more knowledgeable about the disease than externals, and had greater involvement in self-management. People with a high internal locus of control appear to be at an advantage in relation to their reactions to disorders and treatment success.

Disagreement exists concerning the relation of locus of control to adjustment in chronic illness. More positive adjustment has been found to be associated with an external locus of control by some researchers. (Burish et al 1984; Jamieson, Welisch, & Pasnau, 1978). Others have found a strong link between internal locus of control and positive adjustment (Devins et al, 1982; Poll & Kaplan De-Nour, 1980). The inconsistency in these findings may, to some degree, be attributable to the use of a simple, unidimensional conceptualisation of the construct as either 'external' or 'internal'. Chronically ill people are likely to find themselves in a position where they are reliant upon others, such as healthcare professionals, to control their condition to a large extent. It has been proposed by Reid (1984) that, when personal control is not possible, the chronically ill patient's perception of vicarious or participatory control through healthcare professionals may be an important factor in positive adjustment to illness (Christensen, 1991).

Although some studies have found that individuals who have an internal locus of control are more likely to engage in health behaviours, others have found the converse. A study by DeVillis et al (1980) found that epileptic people with an internal locus of control were less likely to adhere to medical advice. They also drove more, drank (not necessarily at the same time) and were more likely to seek out information concerning the disorder. Those with an internal locus of control may be more motivated to take action regarding their own health, and this sense of control may give them the freedom to decide the appropriateness of adhering to certain medical advice. It has been argued that locus of control is totally inappropriate as an explanation of health behaviour (Stainton-Rogers, 1991). In relation to osteoporosis, Gold et al (1991) have argued that locus of control is clinically meaningless in terms of physical and psychosocial outcomes for patients with this chronic disease. However, Oberle (1991) argues that the problem does not lie with the locus of control construct itself, but with the standard of studies that have used it.

Perceived Control and Depressive Symptomatology

Related to locus of control is the concept of perceived control, the theoretical justification for which, is derived from attribution theory. Whereas attribution theory focuses on the causal attributions that people make for past events in their lives, locus of control relates to expectations of control regarding future events (Bradley, 1994). The concept of causal attributions was first put forward by Heider (1958) who made a distinction between perceived causes that originate from within the individual (personal force), and those that are dependent upon the environment or other people (environmental force). This theory has relevance regarding osteoporosis, which can be caused either by factors such as over-dieting and under-exercising (which are under the individual's control), or factors such as genetic predisposition, or steroid administration (which could be considered to be externally controlled). Personal force is composed of dimensions of ability and effort,

whereas environmental force consists of task difficulty and luck. Weiner (1974) put forward the view that causal attributions vary along two dimensions; locus of control, and stability (the extent to which a cause is likely to be consistent over time). A third attributional dimension of 'controllability' was also proposed by Weiner. Thus, causal factors may either be perceived to be within the individual's control, or outside it.

Research findings suggest that the perception of personal control results in positive reactions, whereas the perception of a loss of control results in negative effects. Glass & Singer, (1972) found that the ability to cope with stressors can be enhanced by maintaining a sense of personal control. A perception of no control has been implicated as a key factor in the development of depression (Peterson & Seligman, 1984; Seligman, 1975).

Presson and Benassi (1996) utilised meta-analytic techniques to review studies of the relationship between locus of control and depressive symptomatology. They found that higher beliefs in a lack of internality were associated with depressive symptomatology. Scores on chance and powerful others scales were uniquely associated with higher scores on measures of depressive symptomatology. Reynaert et al (1995) examined the interaction of perceived control with immunological variations in depression, addressing the subjective feeling of control in relation to health, current illness, and treatment. The authors found that NK cell activity was significantly lower in depressed patients, and in patients showing less subjective control. The authors conclude that internal locus of control acted as a buffer against the decrease in cell immunity observed in depression.

A further study by Reynaert et al (1995) looked at health locus of control in relation to improvement on the Hamilton Rating Scale for depression. The results showed that internal locus of control played a significant role in consolidating the improvement

process, irrespective of the type of antidepressant given. Kugler (1994) investigated if the perceived locus of control of patients undergoing heart surgery is related to emotional adjustment. They found that emotional adjustment after heart transplantation may be predicted by pre-surgical ratings of locus of control rather than pre-surgical emotional adjustment.

Research on the association between health locus of control and depression in chronic illness has, however, produced contradictory findings. For example, in a study of 96 hemodialysis patients, Christensen (1991), found that internal locus of control was associated with less depression in patients who had not previously experienced a failed renal transplant. For those returning for dialysis following an unsuccessful transplant, internality was associated with greater depression. These results were revealed only for those suffering severe illness; health locus of control was unrelated to depression among patients with less severe disease. This study highlights the importance of congruence between objective circumstances and beliefs about control in the process of adapting to chronic illness. This may be of particular importance in osteoporosis, the progression of which is often uncontrollable.

Locus of Control and Chronic Pain

The locus of control construct has frequently been used to examine chronic pain sufferers' perceptions of control. Since osteoporosis often results in chronic pain, a brief discussion of the possible link between locus of control and adaptation to chronic pain will now be undertaken. Wells & Nown (1993) made the assumption that chronic pain sufferers who attribute control of their health to powerful others such as doctors, have developed fewer adaptive coping strategies to deal with their pain. Research with cancer patients has shown that those who have an internal locus of control experience less psychological distress

(Marks et al 1986; Taylor et al, 1984). A different set of coping strategies may be employed by chronic pain patients who have an external locus of control. A belief that future pain is dependent upon the intervention of powerful others or chance happenings, is likely to be related to the use of passive coping strategies. Skevington (1983) has demonstrated that back pain patients who attributed events to chance happenings and not to internal control were more likely to be distressed and depressed about their pain. Similar findings were reported by Laborde & Powers (1985) who discovered less self-reported life satisfaction among osteoarthritis patients with external locus of control. Research by Buckelew (1990) demonstrated that female chronic pain patients with internal locus of control tended to use information-seeking, and cognitive restructuring to cope with pain.

The relationship of perceived control and perceived interference of pain in life activities to depression, has been investigated by Rudy et al (1988). Lower levels of depression were detected for those with higher levels of perceived control, and lower levels of perceived interference with activities. These studies lend some support to the notion of a relationship between internal locus of control and positive adaptation to chronic pain.

A cognitive concept that is related to perceived control is self-efficacy. Bandura (1977b; 1982) described self-efficacy as the individual's belief in their own ability to engage in a specific behaviour. Although locus of control and self-efficacy may be related, they are different aspects of perceived control. Whereas self-efficacy is concerned with control of behaviour, internal locus of control orientations do not necessarily result in a belief that the behaviours necessary to achieve valued reinforcement can be undertaken by the individual. Burger (1989) has pointed to the fact that it is not necessary for the individual to actually have control over the relevant events, but rather that he or she perceive this control. Research by Alloy & Abramson (1979) on depressive realism, and Langer (1975) has

demonstrated that people are often inaccurate in their perceptions regarding the extent of their perceived control. It is the perceived level of control, not the actual control, that is important in determining how the individual responds. Sense of exaggerated optimism has been shown to be a common cognitive bias, important for the maintenance of positive psychological adjustment (Taylor & Brown, 1988). However, perceived control in illness is vulnerable to disconfirmation. An increase in severity despite individual efforts, or poor treatment outcomes despite the efforts of medical professionals, may lead to emotional maladjustment as a result of a mistaken belief in personal control over uncontrollable aspects of an illness (Affleck, Tennen, Pfeiffer, and Filfeld, 1987; Burish et al, 1984; Reid, 1984). The disconfirmation of either type of control belief (i.e. internal or powerful others) could result in depression (Christensen, 1991). This links in with Abramson, Alloy & Metalskys' (1989) theory of hopelessness depression which states that regardless of initial causal attributions, anyone can become hopeless depending upon the situation in which they find themselves.

In determining adjustment and response to treatment, self-efficacy has been shown to be an important influencing factor. Litt (1988) demonstrated that self-efficacy beliefs are related to pain tolerance, behaviour, and changes in behaviour. Jenson et al (1991) found that responses of pain patients can be predicted from their appraisals of the likely efficacy of specific coping strategies, together with their perceived ability to employ them. This finding is consistent with the model of stress-appraisal and coping put forward by Lazarus & Folkman (1984). This model states that the individual's appraisals regarding his or her own coping skills, influences the use of specific coping strategies.

In summary, research findings suggest that the perception of personal control results in positive reactions, whereas the perception of a loss of control results in negative effects.

Although early research has dichotomised individuals into either internals or externals, later research suggests that locus of control can be both a state and a trait. It is possible for an individual to be both internal and external depending upon the situational demands being placed on them. Locus of control is also related to causal attributions, and to self-efficacy, which may affect the coping strategies that people choose to use in a given situation.

Coping Strategies in Chronic Illness

Coping may be defined as a process by which the individual seeks to manage the perceived discrepancy between the demands and resources they appraise in a stressful situation. People suffering from osteoporosis are faced with considerable stress due to the effects of the disease. A review of the literature by Fowlie and Berkely (1987) suggests that the well-being of patients might be improved through interventions that teach effective coping strategies. This could be particularly important in chronic, incurable diseases such as osteoporosis.

Early work by Liposki (1970) put forward eight coping strategies which may be directly related to attitudes the individual has towards illness, injury, or disability. These include regarding the illness as a challenge, an enemy, a punishment, a weakness, a relief, a strategy, a value, or an irreparable loss. Later research by Ray et al (1982) criticised such an approach for its neglect of specific coping strategies in favour of an emphasis on general coping style or disposition. Their alternative suggestion, that coping should be regarded as a response to stressors independent of the individual, led them to the presentation of six coping strategies. These include rejection, control, resignation, dependency, avoidance, and minimisation.

It has been argued that coping should be seen, not as a unified construct, but a metaconstruct under which numerous phenomena are embedded (Eckenrode, 1991). The theory of stress and coping developed by Lazarus and Folkman (1984) states that the negative impact of a stressful event on psychological well-being is mediated by how the individual copes with the event. According to this theory, the coping process involves an initial appraisal or evaluation of the threat. During this primary appraisal the individual seeks to evaluate the potential stress properties of the situation (e.g. the diagnosis of a disabling disorder such as osteoporosis). Secondary appraisal involves an investigation of perceived ability to respond to the threat. Coping is the process whereby the individual implements the selected response. Lazarus points out that the process is not static, since it is possible to re-visit a preceding stage in the light of new information. For example, a stressor may be re-appraised as less threatening if a coping strategy is found to be effective. Alternatively, if a coping strategy is found to be less effective than anticipated, the individual may either re-appraise the threat, or seek to identify an alternative response. The coping process has therefore been described as a dynamic series of 'continuous appraisals and re-appraisals of the shifting person-environment relationship' (Lazarus and Folkman, 1984).

Lazarus and Folkman (1984) made a distinction between two types of coping strategy; problem-focused, and emotion-focussed. Problem-focussed coping is an attempt to deal directly with the stressor, and is therefore task-oriented. Emotion-focussed coping is aimed at accepting and managing the emotional distress inevitably elicited by most stressful situations. A problem-focussed approach is likely to result from an appraisal that aspects of an illness can be changed, whereas emotion-focussed coping would be expected to be triggered if the illness is appraised as having to be accepted.

A number of measures have been devised in order to assess coping. The Ways of Coping Checklist (Folkman & Lazarus, 1980) consists of a series of predicates, each portraying a coping thought or action. Responses on the scale indicated that the distinction between emotion-focussed and problem-focussed coping is probably an over-simplification (Alden et al 1980; Aldwin & Revinson 1987; Coyne et al 1981, Folkman & Lazarus 1985). Carver et al (1989) have suggested that neither emotion-focussed, nor problem-focussed coping are single processes, but potentially involve several distinct activities. They developed an instrument (COPE) that can be used to assess both situational coping and dispositional coping. Using the COPE, the authors found evidence to suggest that people tend to adopt certain coping tactics as relatively stable preferences.

The results of some studies suggest that greater use of emotion-focussed coping strategies can result in poorer psychosocial or emotional adjustment to chronic illness (Felton et al 1984; Parker et al 1988; Manne et al 1989; Smith et al 1992; Brown et al, 1997). Research by Holm et al (1986) found that sufferers of chronic headache who used avoidance and self-blame (emotion-focussed strategies), tended to appraise ambiguous stressors as more negative and less controllable than headache-free controls. A longitudinal study by Felton & Reenson (1984) found that emotion-focussed coping in the form of wishful thinking had a negative impact on adjustment to four types of chronic illness, whereas problem-focussed coping (information seeking) was found to have a positive effect. Similar results have been obtained in studies investigating the relationship between coping and psychological conditions often associated with chronic illness. Emotion-focussed coping has been found to be consistently related to depression (Coyne et al 1981, Vitaliano et al 1985) and anxiety (Vitaliano et al 1985; 1987b). Heightened levels of depression in chronic back pain sufferers has been shown to be associated with strategies such as passivity, avoidance, or excessive negativity (Rosenstiel & Keefe 1983; Turner & Clancy

1986). Similar findings have been reported for MS patients (Sullivan et al 1992). Research also suggests that active coping strategies (Brown 1987) such as information seeking (Felton et al 1984; Manne et al 1989), and cognitive restructuring (Parker 1988), are associated with better psychological functioning. However, a later study by Bombadier et al (1990) found no relationship between problem-focussed coping strategies and illness adjustment among sufferers of diverse medical conditions. The same study did report that an emotion-focussed approach, consisting of wishful thinking, self-blame, and avoidance, predicted poorer adjustment to illness.

The correlational design of the studies renders any definitive statement regarding causation problematic. Caution is also needed when attempting to generalise the findings to a particular diagnostic group, such as osteoporosis sufferers, since different coping skills and strategies may be required for different types of illness. A longitudinal, prospective study of osteoarthritis sufferers by Blalock et al (1995) found similarities as well as differences in the strategies people used to cope with different types of illness-related problems. Their study showed that self-criticism and social withdrawal were more frequently used in association with illness-related relationship problems. These strategies were found to be more predictive of greater psychological stress. The authors recommend that, in the light of these findings, future psychological interventions should incorporate coping skills training specific to the interpersonal problems which are likely to elicit maladaptive coping strategies.

Lazarus (1993) has pointed out that whether a coping strategy is adaptive or maladaptive depends on a number of factors, including individual differences, the specific type of encounter, and the outcome being studied. He suggests that, although some coping strategies might more often be better or worse than others, there may be no universally

good or bad ones. In line with this observation, there is significant evidence that under some illness conditions, denial and avoidance can be effective responses (Meyerowitz, 1983). Denial may be a dangerous strategy in the initial, symptomatic stages of some disorders, such as heart disease, but can be useful in the post-coronary hospital care period, provided it does not continue to be employed following discharge (Levine, 1987). Denial as a coping strategy has also been shown to accelerate the healing process, and reduce length of hospital stay following surgery (Cohen, 1973). The same strategy used by asthma sufferers can reduce anxiety during the initial stages of an attack, but lead to increased risk of hospitalisation in acute cases (Staudenmeyer, 1985). Long-term, degenerative disorders such as osteoporosis involve not only the management of acute threat, but also the development of strategies to cope with chronic uncertainty regarding future deterioration. Research by Bendtsen (1994) observed that increasing severity of rheumatoid arthritis resulted in less acceptance and control, and decreased psychological well-being. Lazarus concludes that the effectiveness of a coping strategy will depend on the context of the particular illness, and the way in which the threats associated with it change over time (Lazarus, 1993). Since the threats involved in osteoporosis change in relation to deterioration in the condition, this point is of particular interest in relation to the disorder.

Education

The role of education has been examined in relation to a number of physical disorders. A study by Maes and Schlosser (1988) assessed a cognitive-educational (a combination of health education and rational emotive behaviour modification) intervention programme for altering coping behaviour in asthmatic patients. The ten patients who received the programme became less preoccupied with their asthma and reported significantly less emotional distress compared to control participants. In relation to arthritis, Lindroth et al (1989) reported an increase in knowledge, and changes in some health behaviours as a

result of taking part in an education programme. Similar findings were reported by Bill-Harvey et al (1989) who found that osteoarthritis sufferers increased significantly in knowledge, and improved in attitude towards the illness as a result of taking part in an education programme. In a comparison of a cognitive-behavioural and an education intervention for osteoarthritis, Calfas et al (1992) found that both groups improved equally on measures of pain and depression, and these improvements were stable at 1-year follow-up. Dalton (1987) measured the effect of education on change in knowledge, attitude, and behaviour in patients with a primary diagnosis of cancer who experienced pain related to disease. The programme also involved tuition in distraction techniques, relaxation, and massage. A significant increase in knowledge occurred, together with a behaviour change involving greater use of distraction as a coping strategy. Research has also shown that providing education preoperatively to patients who are about to undergo hip and knee replacement can result in a reduction in costs by decreasing length of stay, and increasing patient satisfaction (Roach et al, 1995).

A study by Gold et al (1989) reported the effects of a medical education programme on psychosocial functioning of older adults with osteoporosis. The programme consisted of intensive education about the disease and its prognosis, physical therapy education, nutritional counselling, and medical evaluation and treatment. Knowledge of osteoporosis increased significantly, along with a renewed sense of hope and optimism which had been missing from the patients lives since they had been given the diagnosis. These improvements remained stable at 1-year follow-up.

Studies which have examined the effects of giving information pre-operatively have reported conflicting findings. A study by Kendall et al (1979) randomly assigned 44 patients facing cardiac catheterisation to either an information group, a cognitive-behavioural intervention group, or one of 2 control groups (an attention placebo, or

standard hospital procedure control). Lower anxiety ratings were demonstrated during the catheterisation for the intervention groups than for either of the two control groups. Contradictory findings were, however, reported by Langer, Janis, and Wolfer (1975), who discovered that information given to general surgical patients had an initial effect of making the impending operation more anxiety-arousing. Miller & Mangon (1983) also reported higher distress in a group given a great deal of information in comparison to a minimal-information group. The extent to which information will be beneficial or detrimental is likely to be inter-related with a range of other factors such as the nature of the medical procedure, individual differences, and whether pain or discomfort resulting from an illness or procedure is likely to be transient or permanent. Several studies have provided examples of how the coping style of patients interacts with information provision in the reduction of anxiety (e.g. Cohen & Lazarus, 1973; Miller & Mangan, 1983; Wilson et al, 1982). Research by Cohen & Lazarus (1973) found that while some patients actively sought information prior to surgery, others actively avoided it. Those who avoided information made a speedier recovery from surgery.

The studies reviewed here suggest that education has an important role to play in rehabilitation programmes for osteoporosis. Lifestyle advice including dietary and exercise measures are important in developing and maintaining a high peak bone density. Supportive health education programmes that focus on the issues resulting from osteoporosis may benefit sufferers. Self-management training may help sufferers to make informed choices by enhancing both their knowledge of the condition and their problem-solving skills. Lorig (1993) defined self-management as “learning and practising skills necessary to carry on an active and emotionally satisfying life in face of a chronic condition”. People who are encouraged and educated to do more for themselves and to take an active part in their treatment decisions are likely to develop higher levels of

perceived control. A greater sense of independence and self-efficacy is likely if osteoporosis sufferers are enabled to take more responsibility for their personal health and well-being. This can be achieved by providing education programmes which seek to properly inform sufferers about the disease, and to equip them with the knowledge and skills needed to be more personally involved in its future management.

Aims

The literature reviewed here suggests that adaptation to chronic pain and illness is affected by the repertoire of coping strategies individuals have at their disposal. Ineffective methods of coping have been linked to many of the problems associated with chronic pain and illness. These problems can include factors such as depression and anxiety. A psychosocial intervention which aims to teach specific techniques such as distraction, imagery, and relaxation, should be capable of enhancing adaptive coping for osteoporosis sufferers. The literature regarding relaxation suggests that such techniques are likely to reduce anxiety evoked by pain and fear of fracture, and assist osteoporosis sufferers to bring pain levels under control. In view of the research findings by Puder (1988) that there was no relationship between age and outcome, such an approach should be equally as effective for older adults with osteoporosis as for their younger counterparts.

A cognitive-behavioural approach with osteoporosis sufferers should aim to equip them with a repertoire of coping strategies, together with education on how and when to employ them. Empowering sufferers to use the learned techniques may be an important factor in enhancing perception of personal control, which has been found in several studies reviewed here, to be associated with more positive reactions to chronic pain and illness. Allowing individuals to decide for themselves upon particular strategies should further enhance their belief in self-control.

Unlike internal locus of control, which has been found to be associated with improved adaptation to illness, external locus of control has been linked to less successful outcomes. A perception of no control has been implicated in the development of depressive symptomatology. The present study predicts that education and coping skills training will alter the balance between internal and external control beliefs, with an increase in the former, and a decrease in the latter. Since internal locus of control has been found to be associated with lower depression and an enhanced ability to cope with stressors, it is anticipated that altering control beliefs to be more internal will result in improvements in depression and anxiety. The development of coping strategies to deal with chronic pain should be capable of dissuading sufferers away from strong beliefs in chance happenings and powerful others control over it. If active, rather than passive coping strategies are taught to osteoporosis sufferers, it is likely that they will report a greater perception of control over pain.

Education involves the seeking of information, which is an active coping strategy found to be associated with internal locus of control in chronic pain patients. It is predicted that education will therefore have a similar effect with osteoporosis sufferers. Research reviewed here suggests that an increase in knowledge, together with improved anxiety, depression, pain, and attitude towards the illness can result from taking part in an education programme. It has, however, been suggested by some researchers that education can raise anxiety levels. It is suggested here that the way in which education is delivered is an important factor in determining whether anxiety levels will increase or decrease. If education is delivered in a sensitive and supportive manner on an individual basis, and as part of a cognitive-behavioural intervention, it is anticipated that knowledge will increase, and anxiety, pain, and depression will all decrease. It can be seen from the preceding literature review that disease knowledge, locus of control, pain, depression, and anxiety are

inter-relating factors involved in adaptation to chronic illness. An intervention which seeks to address these factors should therefore be capable of altering outcome in a positive manner.

The present study seeks to compare the effects of a cognitive-behavioural intervention (consisting of education, relaxation techniques, and instruction in the use of coping strategies), with a postal education package for osteoporosis sufferers. It was predicted that intervention patients would experience significant improvements in psychosocial functioning when compared with a group receiving postal education, and with a non-treatment control group. It is further predicted that older adults will not differ from their younger counterparts in their ability to benefit from the programme.

Method

Hypotheses

1. Self-reported pain will decrease significantly post-intervention for the psychosocial intervention group, compared to the informational comparison group, and the control group.
2. The psychosocial intervention group will score significantly higher on internal locus of control post-intervention than the informational comparison group, and the control group.
3. External locus of control (subdivided into powerful doctor, and chance happenings) will significantly decrease for the psychosocial intervention group, whilst increasing for informational comparison group, and the control group.
4. Scores for depression will significantly decrease for the group receiving psychosocial intervention compared with the informational comparison group, and the control group.
5. Anxiety scores will decrease significantly for the psychosocial intervention group, in comparison to the informational comparison group, and the control group.
6. Knowledge about osteoporosis will increase significantly for psychosocial intervention group in comparison with the informational comparison group, and the non-treatment control group.

7. There will be no relationship between age and any of the dependent measures.
8. There will be a significant relationship between the use of maladaptive and adaptive coping strategies, and dependent measures of depression, anxiety, locus of control, and pain ratings at follow-up.

Design

The study used a mixed design. The independent variables for the between groups design were the psychosocial intervention, the education package, and age of participants. The dependent variables were outcome measures of pain, locus of control, depression, anxiety, and disease knowledge. The independent variables for the within participants design were adaptive and maladaptive coping strategies. Pain ratings, locus of control, depression, and anxiety were the dependent variables. It was predicted that osteoporosis sufferers who received a psychosocial intervention containing an education component would report a decrease in pain, external locus of control, depression, and anxiety, together with increased disease knowledge and internal locus of control, compared with a group receiving postal education and a non-treatment control group. It was further predicted that older adults would not differ significantly in their ability to benefit from the intervention from their younger counterparts. Ethical clearance for this study can be seen in appendix 6.

Participants

The participants for the study consisted of a defined group of 12 males and 18 females with established osteoporosis and vertebral fracture or fractures. Criteria for selection onto the programme *were* (was) that all participants had been referred by their G.P. to the Rheumatology Department regarding osteoporosis and associated pain. All participants had undergone bone density measurements which demonstrated a significant level of bone mineral loss.

Participants were matched for sex, with 6 females, and 4 males in each of the three groups. An attempt was made to match for age (see table 1) with a mean age of 61 years ranging from 31 to 77 years (see table 2). Matching for duration of illness was problematic, since the disease is typically silent until a fracture occurs and the sufferer is alerted to its presence by the accompanying pain. In many fracture cases, osteoporosis can continue to remain undiagnosed due to poor access to monitoring equipment. When the participants in this study were questioned, all of them revealed that they had been suffering some degree of pain and disability for a number of years preceding diagnosis, but could not remember precise dates. It was therefore decided that no reliable way of matching the participants on the basis of duration of illness was available. Attempts to do this were therefore abandoned as being unrealistic. Of the 50 osteoporosis sufferers approached to take part in the study, 10 declined from the outset, a further 6 dropped out following baseline data collection, 2 were deceased, and 2 were excluded from the study due to multiple diseases in addition to osteoporosis.

AGE		
Group 1	Mean	59.7000
	N	10
	Std. Deviation	14.1974
Group 2	Mean	60.5000
	N	10
	Std. Deviation	13.0320
Group 3	Mean	61.5000
	N	10
	Std. Deviation	9.3125
Total	Mean	60.5667
	N	30
	Std. Deviation	11.9472

Group 1 = psychosocial intervention group

Group 2 = informational comparison group

Group 3 = control group

Table 1 To show the Means and Standard Deviations of the age of participants.

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	30	31.00	77.00	60.5667	11.9472
Valid N (listwise)	30				

Table 2 To show the range of ages of the participants

Procedure

A pilot study was undertaken in order to ascertain the length of time the questionnaire booklet took to complete, and to detect any flaws which might need to be corrected. Ten osteoporosis sufferers attending a self-help support group run by the NOS were asked to complete the booklet. Their comments were then collected verbally by the group organiser, and fed back to the researcher. On the basis of these comments it was decided that too many measures were being used, resulting in the questionnaire booklet being too lengthy and time-consuming. A decision was therefore made to remove the Patient Request Form which was designed to elicit information regarding patient satisfaction with medical services in connection with their disorder.

All the participants in the study were sent an information sheet and a consent form, which they were requested to sign and return if they were prepared to take part in the study (see appendix 1 and 2 respectively). The sample of 30 participants was divided into 3 groups (as previously mentioned). Participants in group 1 (psychosocial intervention group) were asked to attend the outpatients clinic in the Rheumatology Department of the local hospital where they received a psychosocial intervention comprising coping skills training, relaxation techniques, and education. This group will be referred to throughout this study as the 'psychosocial intervention group'. Baseline and follow-up measures of disease knowledge, locus of control, depression, anxiety, and pain ratings were taken for all three groups (see appendix 3 for questionnaire booklet).

The second group were asked to complete the questionnaire booklet at baseline, and return it in the stamped, addressed envelope provided. On receipt of the completed questionnaire booklets, this group were sent an education booklet entitled 'Osteoporosis: A Guide for

Sufferers' (see appendix 4). Two months later a second questionnaire booklet was sent to this group, along with a stamped, addressed envelope for its return. This group will be referred to throughout this study as the 'informational control group'.

A third group of participants were asked to complete the questionnaire booklets at the baseline stage, and at two month follow-up, and return them through the postal system in the envelopes provided. This group received no intervention, and will be referred to as the 'non-treatment control group'.

Psychosocial Intervention

Session 1

The psychosocial intervention group were sent the questionnaire booklet through the postal system, and requested to complete it and bring it with them to the first therapy session at the clinic. The first session was an assessment interview which was used to build up a rapport with each participant, and to gather information which would later be used to tailor the intervention to the needs and preferences of the individual. The basic approach underlying each individually tailored intervention was cognitive-behavioural, it was the detail that differed between participants.

Session 2

A second session involved a presentation of the education booklet entitled 'Osteoporosis: A Guide for Sufferers' with each client on an individual basis. A great deal of time and care was taken at this stage to listen to the clients' concerns; to monitor their non-verbal and verbal communication in response to items of information explained to them from the booklet; constantly reassure them regarding any concerns, and to ensure that they fully comprehended the information by clarifying any points they found ambiguous, or

expanding on any areas that were of particular interest to them. Clients were introduced to an array of coping strategies for managing stress and pain, and requested to select their favoured ones for inclusion on a future tape recording. At the end of this session the education booklet was given to the participants for them to keep for future reference. They were encouraged to read it again and write down, and bring to the next session, anything they needed clarification on.

Session 3

This session lasted one-and-a-half hours, and began with a brief discussion about the education booklet in order to answer any additional questions participants had thought of since the last session. Clients choices regarding which particular coping strategies they favoured for inclusion on their personalised tape recording, were further discussed and agreed. Passive muscle relaxation was then employed in unison with autogenic training. Visual imagery was also used as a distraction technique, and to further aid relaxation.

One of the effects of stress is to increase the breathing rate. Diaphragmatic breathing was therefore taught to the participants, in which they were encouraged to take longer, deeper breaths, filling up their lungs all the way, allowing the stomach to swell out as the breath was taken in, and to flatten again as the breath was released. The out breath was accompanied by a count down from 8 to 1 in order to ensure that all the breath was completed exhaled.

It was explained to the participants that the stress response to pain can be kept under control by using relaxation techniques on a daily basis. Participants were advised that, when their tape recording was completed, it was advisable to play it at least once a day, in addition to using it at particular times when they felt the need to bring their pain and/or

tension under control. Written instructions were also provided (see appendix 5). In view of the nature of the disorder and the increased fracture risk, progressive muscle relaxation (PMR) was discounted in favour of passive muscle relaxation.

Participants were guided to visualise a beautiful place out in nature (e.g. beach) with the blue sky all around them; the sound of the seagulls crying, and the rhythmic sound of the waves lapping gently against the shore. Some participants expressed a preference to be transported in their imagination to a garden or favoured piece of countryside, with the therapist as their guide. The procedure was therefore modified according to such preferences.

Once this imaginative transportation was in place, participants were requested to visualise a beam of light from the sun moving slowly over their body, starting at their feet and finishing with their head. Participants were then guided to imagine the beam of light progressively moving over the major muscle groups, penetrating the skin, and the muscle, and the bone, warming, relaxing, and healing. Some participants expressed an aversion to the sun, highlighting the importance of tailoring the intervention to the needs and preferences of the individual as suggested by Pearce and Erskine (1989). Some clients were therefore guided to imagine a warm, orange coloured liquid entering their body thorough their feet, filling up their body like a glass container, and warming and relaxing all the major muscle groups. The orange coloured liquid then gradually leaving the body through the feet, taking all the tension with it.

Following the relaxation procedure, clients were taught specific strategies to both aid relaxation, and to cope with pain and fear. Most of the strategies used were also explained in the education booklet entitled Osteoporosis: A Guide for Sufferers (see appendix 4

pp17-20 of the booklet). Others were devised after the booklet was written, and in collaboration with individual sufferers during assessment. A brief example of some coping strategies that were not included in the booklet, will be given here.

Example 1 - Coping Strategy for Pain

'As you sit or lie there in your beautiful place out in nature, with the light from the sun forming a protective cocoon around your body, you will notice the clouds floating by in the blue sky like little pieces of cotton wool. I want you to imagine that a thread is attached to the forefinger of your right hand, and tied to the other end of the thread are some helium balloons. Now as the breeze gently lifts the balloons, I want you to imagine that, because your finger is attached to the balloons by a thread, your finger slowly begins to lift also. You are not making it happen, you are letting it happen. Just allow your finger to gently lift, and as it lifts, the pain will go down. As the finger lifts and lifts, the pain will go down and down. Allow the breeze to hold the balloons for as long as you need to. then when you are ready, imagine that the breeze is dropping, and allowing your finger to gently fall as the balloons sail down to rest by your side. You will be able to use this technique whenever you feel the need to bring your pain under control. The more you practise this technique, the better you will become at controlling your pain.

Example 2 - Coping Strategy for Pain and Stress

Now I want you to imagine that in front of you is a large bubble, large enough for you to step inside. The bubble is in your favourite colour, and is made from a transparent, but strong enough material to hold you. Inside the bubble are some lovely, large, billowy cushions for you to sink into; just like when you were a baby, and you were fed and gently laid in a soft, comfortable warmth. This is a special bubble, because, if you want to do so, you can make it float with you inside. Imagine now that you are inside the bubble, and it is

gently lifting off the ground and up into the sky, as high or as low as you wish it to go. As the bubble rises, you are leaving behind all the pain, all the tension, all the anxiety, all the fear. You are floating with the blue sky all around you, and as you float above the pain and anxiety and fear, in your safe, secure bubble, you feel a deep sense of peace and contentment. While you are in the bubble, nothing can harm you, nothing can touch you. You are warm, safe, and secure; and you have left behind all the pain, all the tension, all the anxiety, all the fear. You can see spreading out before you all the beauty of the countryside; the treetops, and the green fields sweeping down to the golden sand where the sea gently laps against the shore. This deep sense of peace and contentment you feel can be yours whenever you want it to be. All you have to do is to imagine that you are entering your bubble and floating above the pain, the tension, the anxiety, the fear. When you are ready you can bring the bubble gently back down to earth, and step outside it again feeling refreshed. It is as if you have been on holiday to a beautiful place, and now you are back.

At the end of this session, participants were given the tape recording of the techniques used so that they could play it at home on a regular basis. The written instructions were also provided (see appendix 5).

Follow-up

Participants were sent a second questionnaire booklet at two month follow-up, which they were requested to complete and bring along with them to a final appointment at the clinic. During this session, participants were debriefed regarding the purpose of the study. Any queries regarding the treatment were dealt with, and the intervention was brought to a close.

Measures

The following measures were used at baseline and follow-up with all 30 participants (see appendix 3).

Pain

The McGill Pain Questionnaire (Melzack (1975) was used to assess different components of pain. Respondents are offered 78 adjectives which are grouped into 20 subclasses describing different aspects of pain. The number of words chosen can be scored to derive separate scores for three major pain descriptors: sensory, affective, and evaluative. The rank values of the words chosen by the respondent are added to obtain a Pain Rating Index (PRI) for each of the subclasses as well as a total score. A higher score is indicative of a higher level of pain report.

Psychometric Status of the MPQ

Some evidence of the test-retest reliability of the measure has been reported by Melzack (1975). High internal consistency has been indicated by high correlations between different PRI categories. The face validity of the measure has been inferred from the way the items were chosen from earlier studies investigating how patients described pain. Although no other formal validity data have been presented, there are indications that the MPQ scores correlate in the expected direction with other direct and indirect measures of pain report. Melzack (1975) has reported data from a treatment study, indicating that the MPQ is both sufficiently sensitive to detect differences between various pain relief methods and also able to provide information about the effects of a specific treatment on the sensory, affective and evaluative dimensions of pain. The MPQ is a very widely used and well-known pain report measure.

Locus of Control

The Beliefs about Pain Control Questionnaire (BPCQ), devised by Skevington (1990) was used to measure locus of control. This is a 13 item questionnaire which requires respondents to rate their degree of agreement/disagreement with the statements using a six-point, Likert-type scale ranging from 'strongly disagree' to 'strongly agree'. The questionnaire contains three subscales which measure beliefs in the internal or personal control of pain, beliefs that powerful others (doctors) control pain, and beliefs that pain is controlled by chance happenings or luck. These scales were designed with reference to earlier scales measuring perceived control (Levenson and Miller, 1976) and health locus of control (Wallston et al, 1976).

Psychometric Status of the BPQ

Cronbach's alpha has been used to assess internal consistency of the measure. The most reliable scale was Powerful Doctor (0.82), followed by internal locus of control (0.73) and chance happenings (0.56). The overall internal consistency was high in chronic pain and non-patients groups. Test-retest reliability has been tested on chronic pain patients, and found to be high (Skevington, 1990). The content validity of the scale has, to some extent, been defined by the selection of items with reference to other locus of control scales which measure the same aspects of the construct.

Depression and Anxiety

The Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983) was used to measure anxiety and depression. The HADS consists of two subscales, one measuring anxiety (A-scale) and one measuring depression (D-scale), which are scored separately. Seven of the 14 items measure anxiety, and the remaining 7 measure depression. Each item consists of a statement followed by a choice of four possible responses. A maximum

score of 21 is possible on each subscale. According to the scale, a score between 0-7 is normal; 8-10 indicates mild depression or anxiety; 11-14 indicates moderate depression or anxiety, and 15-21 is indicative of severe depression or anxiety. The HADS is a present-state instrument; the instructions emphasise that the state to be recorded on the questionnaire is the state 'over the last few days'.

Psychometric status of the HADS

The internal consistency of the two subscales of the HADS has been established by Zigmond and Snaith (1983) and Moorey et al, (1991). Cronbach's alpha was 0.93 for the A-scale, and 0.90 for the D-scale when tested on 568 cancer patients (Moorey et al, 1991).. The validity and reliability of the HADS was reviewed by Fallowfield (1986) and found to be satisfactory.

Coping

The COPE (Carver et al, 1989) was used to measure the ways in which the participants cope with stressful situations.. The COPE is a multidimensional coping inventory which incorporates 13 conceptually distinct scales which were developed on theoretical grounds or chosen on the basis of previous work which demonstrated their role in facilitating or impeding adaptive coping in different contexts. The COPE can be used to assess situational coping, or dispositional coping. For the purposes of the present study, the measure was used to assess dispositional coping (typical responses to stressors).

Psychometric Status of the COPE

The internal consistency of the COPE scales has been found to be high, with Cronbach's alpha exceeding 0.6 for all but one of the scales. Test-retest reliability over six- and eight-week periods ranged from 0.42 to 0.89 (Carver et al 1989) for the scales. Construct validity for the COPE has also been found to be good.

Knowledge about Osteoporosis

An Osteoporosis Awareness Questionnaire was devised to measure participants' knowledge about the disorder pre- and post intervention. The questionnaire consists of 20 items which were chosen with reference to questionnaires used by the Osteoporosis Society. A true/false format was used, with correct answers awarded a 1, and incorrect answers assigned a zero. This questionnaire is presented in appendix 3.

Psychometric status of the Osteoporosis Awareness Questionnaire

Test-retest reliability was assessed by administering the questionnaire to 10 respondents and repeating measurement after a two week interval. A significant correlation of 0.99 was obtained showing good test-retest reliability. Construct validity was assessed by administering the questionnaire to 5 qualified medical staff who would be expected to have a high level of knowledge regarding the disorder, and 5 secretaries whose knowledge level would be expected to be low. An Eta value of 0.99 indicated a strong association between respondents' answers at time 1 and at the two-week interval. A t-test carried out on the data revealed a significant difference between the groups, with the qualified medical staff scoring consistently higher in terms of knowledge about osteoporosis, than the secretaries ($t=20.24$, $df8$, $p<0.01$). These results demonstrate good construct validity of the questionnaire.

Results

Baseline

Analysis of the pre-intervention data detected no significant differences between the groups regarding awareness of osteoporosis, depression, anxiety, or internal locus of control at that stage. A significant difference was, however, found for pain rating index (PRI) between the groups at baseline. The results of t-tests carried out on the data at the baseline stage before any intervention was implemented revealed a significant difference between groups the psychosocial intervention group and the informational comparison group, with the former group reporting higher pain ratings than the latter group ($t=2.473$, $df18$, $p<0.05$). No significant differences were found at this initial stage of analysis between the informational comparison group and the non-treatment control, nor between the psychosocial intervention group and the non-treatment control for pain ratings. No significant differences were found between the psychosocial intervention group and the informational comparison group at baseline for powerful doctor locus of control. However, the psychosocial intervention group was significantly different in this regard from the non-treatment control group ($t=-3.318$, $df18$, $p<0.05$). The two control groups also differed significantly at this stage regarding powerful doctor locus of control ($t=-2.426$, $df18$, $p<0.05$). Similar findings were obtained for chance happening locus of control. In this regard, the only significant difference at baseline was between the psychosocial intervention group, and the non-treatment control ($t=-3.543$, $df18$, $p<0.001$).

The main analysis was carried out using ANOVAS for repeated measures. A number of significant differences between the three groups from baseline to end of treatment were revealed.

Pain

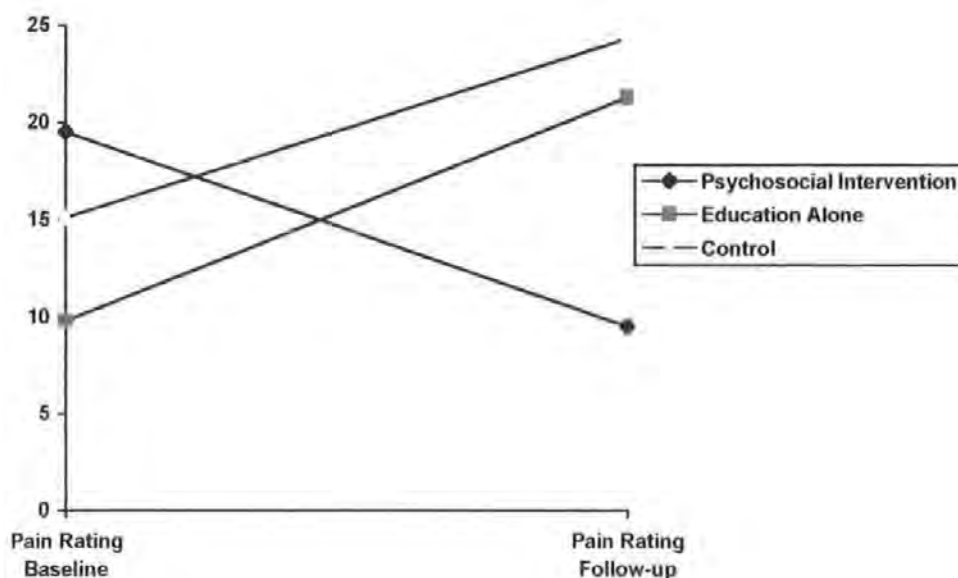
An analysis of variance for repeated measures carried out on the data for the pain ratings index (PRI) revealed significant results for group by time $F(2,27) = 17.013$, $p < .001$), and time $F(1,27) = 5.215$, $p < 0.05$), but not for group $F(2,27) = .964$, $p > 0.05$). The ANOVA table for these results is presented in Table 3. Graph 1 shows that pain ratings decreased from baseline to follow-up for the psychosocial intervention group. An increase occurred for the informational comparison group, and also for the non-treatment control. Table 4 shows the means and standard deviations for these results. The result of t-tests carried out on these data revealed that the changes were significantly different between the intervention group and the informational comparison group ($t = -2.279$, $df 18$, $p < 0.05$). A significant difference was also noted between the intervention group and the non-treatment control groups ($t = -3.790$, $df 18$, $p < 0.001$), but not between the informational comparison group and the non-treatment control ($t = -.534$, $df 18$, $p > 0.05$). These findings lend support to hypothesis 1, which predicted that self-reported pain would decrease significantly for the psychosocial intervention group from baseline to follow-up compared to the informational comparison group and the non-treatment control.

The McGill Pain Questionnaire also distinguishes a number of dimensions of pain. These are sensory, affective, evaluative, and present pain intensity all decreased for the psychosocial intervention group. Sensory pain and present pain intensity increased for the informational comparison group and the non-treatment control group. Affective and Evaluative pain increased for the informational comparison group, and remained stable for the non-treatment control group. Of these, the only significant difference between the three groups from baseline to follow-up was for sensory pain for group by time $F(2,27) =$

10.163, $p < .05$). No significant result was obtained for time $F(1,27) = 3.762$, $p > 0.05$, nor for group $F(2,27) = 1.382$, $p > 0.05$. These results are shown in Table 5.

	SS	DF	MS	F	Sig
Time	205.350	1	205.350	5.215	.030
Error	1063.250	27	39.380		
Time by Group	1339.900	2,27	669.950	17.013	.000
Group	286.300	2	143.150	.964	.394
Error	4008.850	27	148.476		

Table 3 - Showing ANOVA results for the Pain Rating Index (PRI)



Graph I -Showing a decrease in pain ratings for the psychosocial intervention group and an increase for the other two groups from baseline to follow-up.

Descriptive Statistics

	GROUP	Mean	Std. Deviation	N
PR1	1.00	19.5000	9.9471	10
	2.00	9.8000	7.4057	10
	3.00	15.1000	7.4005	10
	Total	14.8000	8.9996	30
PR2	1.00	9.9000	6.2796	10
	2.00	21.3000	14.5147	10
	3.00	24.3000	10.2421	10
	Total	18.5000	12.2467	30

Table 4 - Showing Means and Standard Deviations for Pain Ratings at Time 1(PR1) and Time 2 (PR2)

Group1 = Psychosocial Intervention Group
 Group 2 = Informational Comparison Group
 Group 3 = Non-treatment Control

	SS	DF	MS	F	Sig
Time	81.667	1	81.667	3.762	.063
Error	586.100	27	21.707		
Time by Group	441.233	2,27	220.617	10.163	.001
Group	196.300	2	98.150	1.382	.268
Error	1918.100	27	71.041		

Table 5 - Showing ANOVA results for Sensory Pain

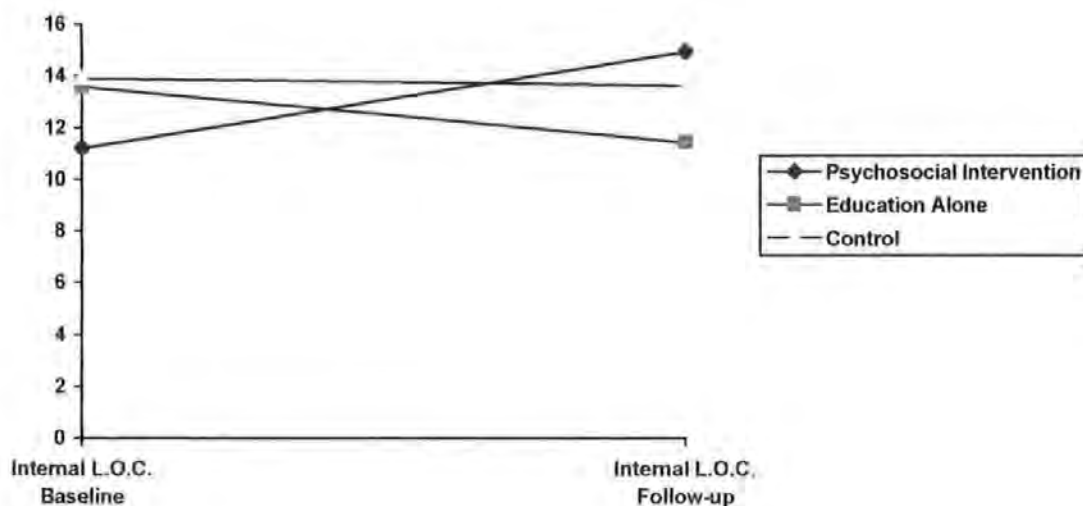
Locus of Control (L.O.C)

Internal Locus of Control

Significant differences were observed between the three groups from baseline to follow-up for internal locus of control. The results showed a significant result for time by group $F(2,27) = 5.373$, $p < .01$, but not for time $F(1,27) = .284$, > 0.05 , nor for group $F(2,27) = .159$, > 0.05 . These results are presented in Table 6. Graph II shows that the greatest difference was between the psychosocial intervention group and the informational comparison group. Table 7 presents the means and standard deviations for these results. The findings support hypothesis 2 which predicts that internal locus of control for the psychosocial intervention group will be significantly higher post-intervention than for the two other groups.

	SS	DF	MS	F	Sig
Time	2.400	1	2.400	.284	.598
Error	227.900	27	8.441		
Time by Group	90.700	2,27	45.350	5.373	.011
Group	15.700	2	7.850	.169	.854
Error	1330.700	27	49.285		

Table 6 - Showing ANOVA results for Internal Locus of Control



Graph II - Showing the amount of change between the three groups from baseline to follow-up.

Descriptive Statistics

	GROUP	Mean	Std. Deviation	N
LCINT1	1.00	11.2000	4.2895	10
	2.00	13.6000	6.6198	10
	3.00	13.9000	5.5267	10
	Total	12.9000	5.5045	30
LCINT2	1.00	14.9000	5.6065	10
	2.00	11.4000	4.1150	10
	3.00	13.6000	5.6608	10
	Total	13.3000	5.2071	30

Table 7 - Showing Means and Standard Deviations for Internal Locus of Control at Time 1 (LCINT1) and Time 2 (LCINT2).

Group 1 = Psychosocial Intervention Group

Group 2 = Informational Comparison Group

Group 3 = Non-treatment Control

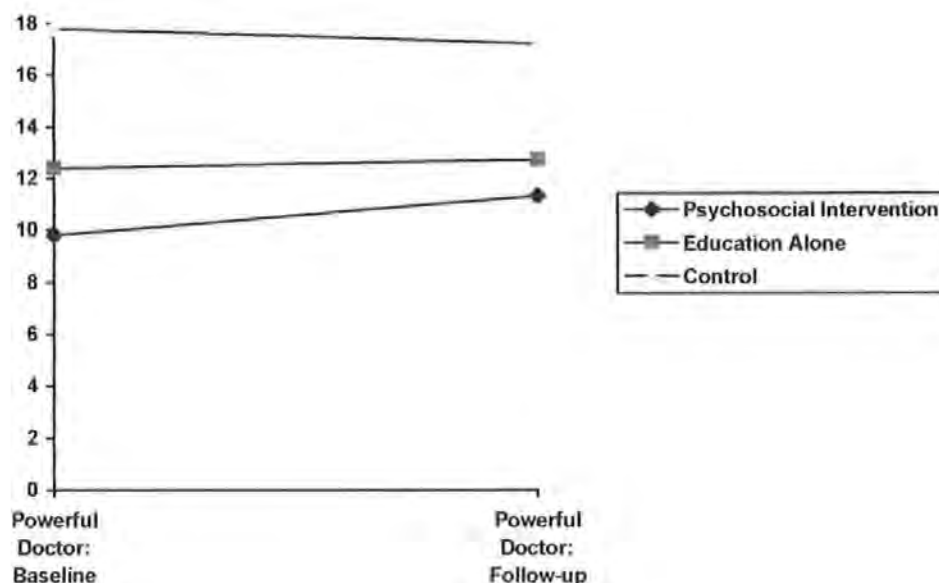
External Locus of Control (Powerful Doctor)

No significant differences were observed for powerful doctor locus of control between the groups from baseline to follow-up. Group by time was not significant $F(2,27) = .699$, $p > .05$, nor was the result for time $F(1,27) = .302$, $p > .05$. A significant result was obtained for group $F(2,27) = 7.937$, < 0.05 . These results are reported fully in Table 8, Graph III

indicates that there was a trend towards the psychosocial intervention group and the informational comparison group to increase in powerful doctor locus of control, while a decrease occurred for the non-treatment control group. These findings do not lend any support to hypothesis 3 which states that powerful doctor locus of control will decrease significantly for the psychosocial intervention group in comparison to the informational comparison group, and the non-treatment control group. Table 9 presents the means and standard deviations for these results.

	SS	DF	MS	F	Sig
Time	2.400	1	2.400	.302	.587
Error	214.500	27	7.944		
Time by Group	11.100	2,27	5.550	.699	.506
Group	512.033	2	256.017	7.937	.002
Error	870.900	27	32.256		

Table 8 - Showing ANOVA results for Powerful Doctor Locus of Control



Graph III - Showing that an external 'powerful doctor' locus of control increased for the psychosocial intervention group, and for the informational comparison group. It can be seen that a decrease occurred for the non-treatment control group. These differences were not statistically significant.

Descriptive Statistics

	GROUP	Mean	Std. Deviation	N
LCPD1	1.00	9.8000	4.3410	10
	2.00	12.4000	3.2042	10
	3.00	17.8000	6.2681	10
	Total	13.3333	5.7195	30
LCPD2	1.00	11.3000	3.9455	10
	2.00	12.7000	2.2136	10
	3.00	17.2000	5.6332	10
	Total	13.7333	4.7701	30

Table 9 - Showing Means and Standard Deviations for Powerful Doctor Locus of Control from Time 1 (LCPD1) to Time 2 (LCPD2).

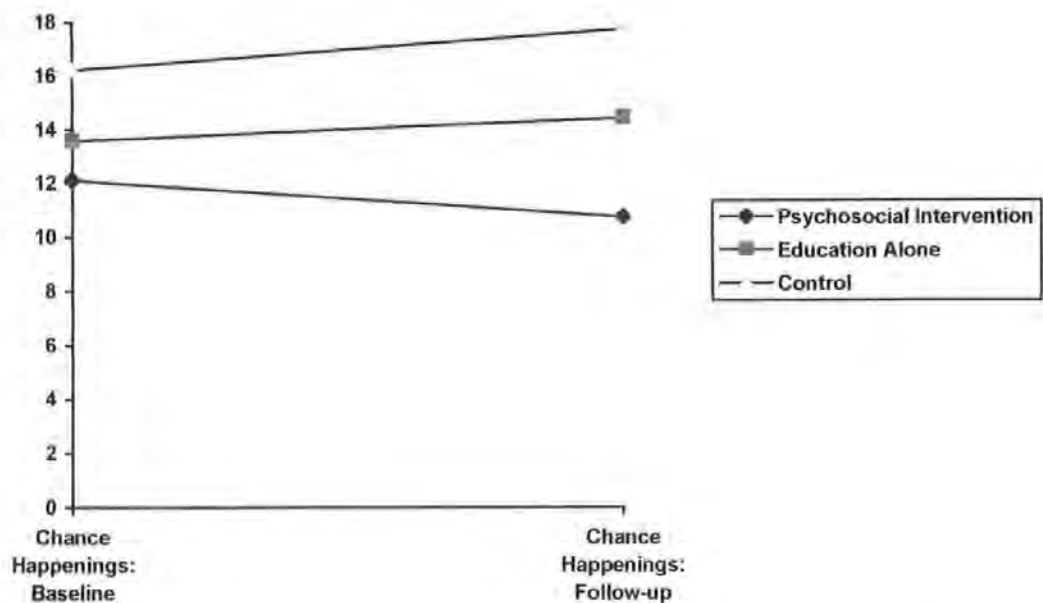
Group 1 = Psychosocial Intervention Group
Group 2 = Informational Comparison Group
Group 3 = Non-treatment Control

External Locus of Control (Chance Happenings)

A belief that pain experience in the future is down to luck or 'chance happenings' decreased for the psychosocial intervention group, and increased for the other two groups. These differences between the groups from baseline to follow-up were not, however, significant $F(2,27) = 2.449$, $p > .05$ (time by group). Graph IV presents these results. No significant result was obtained for time $F(1,27) = .289$, $p > 0.05$, but a significant result was shown for group $F(2,27) = 9.700$, $p < 0.05$. These results are presented in Table 10, and Table 11 shows the means and standard deviations. Hypothesis 3 predicted that an external locus control belief of chance happenings would significantly decrease for the psychosocial intervention group, whilst increasing for the other two groups. Since these differences occurred, but were not significant, hypothesis 3 is not supported.

	SS	DF	MS	F	Sig
Time	1.350	1	1.350	.0289	.595
Error	126.250	27	4.676		
Time by Group	22.900	2,27	11.450	2.449	.105
Group	308.433	2	154.217	9.700	.001
Error	429.250	27	15.898		

Table 10 - Showing ANOVA results for Chance Happenings Locus of Control.



Graph IV - Showing a trend for the locus of control belief in 'chance happenings' to decrease for the group receiving education plus psychosocial intervention, and to increase for the other two groups.

Descriptive Statistics

	GROUP	Mean	Std. Deviation	N
LCCH1	1.00	12.1000	2.3310	10
	2.00	13.6000	3.8064	10
	3.00	16.2000	2.8206	10
	Total	13.9667	3.4087	30
LCCH2	1.00	10.7000	2.3594	10
	2.00	14.4000	3.6271	10
	3.00	17.7000	3.8887	10
	Total	14.2667	4.3544	30

Table 11 - Showing Means and Standard Deviations for Chance Happenings Locus of Control for Time 1 (LCCH1) and Time 2 (LCCH2)

Group 1 = Psychosocial Intervention Group

Group 2 = Informational Comparison Group

Group 3 = Non-treatment Control

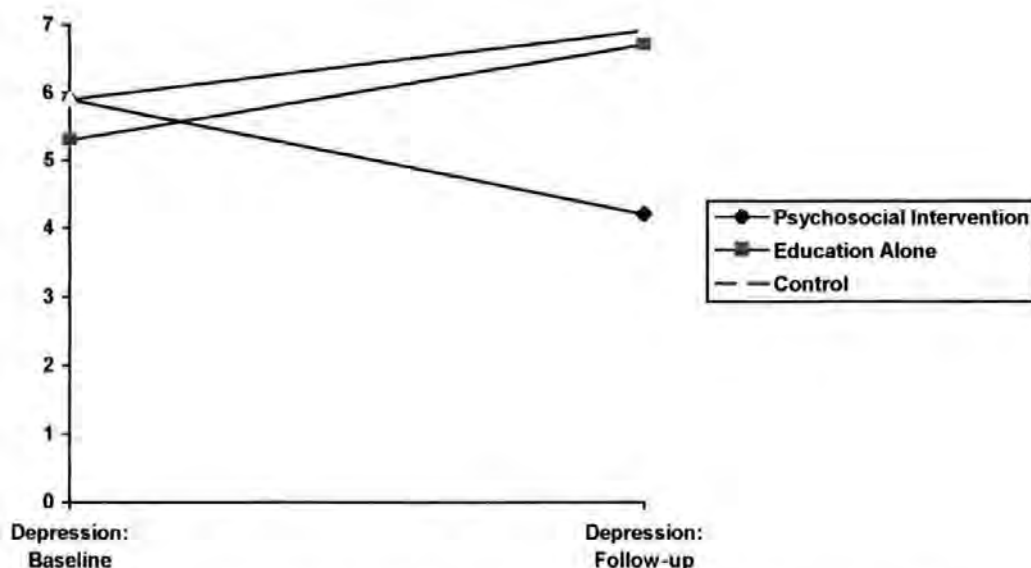
Depression

A significant interaction for time by group was found for depression $F(2,27) = 5.034$, $p < 0.05$. The results of the analysis were not significant for time $F(1,27) = .289$, $p > 0.05$, or group $F(2,27) = .564$, $p > 0.05$. These results are reported in Table 12. Depression

decreased from baseline to follow-up for the psychosocial intervention group. It can be seen from Graph V that depression rose for the information comparison group, and for the non-treatment control group. Table 13 presents the means and standard deviations for depression at baseline and follow-up. Significant differences were revealed by t-tests between the psychosocial intervention group, and the informational comparison group ($t=-2.691$, $df18$, $p<0.05$), between the psychosocial intervention group and the non-treatment control group ($t=-2.048$, $df18$, $p<0.05$), but not between the informational comparison group and the non-treatment control group ($t=-.135$, $df18$, $p>0.05$). Hypothesis 4 predicted that a significant decrease would occur for the psychosocial intervention group post-intervention compared with the other two groups. Hypothesis 4 is therefore supported by these findings.

	SS	DF	MS	F	Sig
Time	.817	1	.817	.289	.595
Error	76.250	27	2.824		
Time by Group	28.433	2,27	14.217	5.034	.014
Group	19.233	2	9.617	.564	.575
Error	460.250	27	17.046		

Table 12 - Showing ANOVA results for Depression.



Graph V - Showing that scores for depression on the HADS decreased post intervention for the psychosocial intervention group. Scores increased for the informational comparison group, and for the non-treatment control group.

Descriptive Statistics

	GROUP	Mean	Std. Deviation	N
DEPRESS1	1.00	5.9000	4.1753	10
	2.00	5.3000	2.7909	10
	3.00	5.9000	3.2128	10
	Total	5.7000	3.3337	30
DEPRESS2	1.00	4.2000	1.3984	10
	2.00	6.7000	2.5841	10
	3.00	6.9000	3.9285	10
	Total	5.9333	3.0050	30

Table 13 - Showing Means and Standard Deviations for Depression at Time 1 (Depress1) and Time 2 (Depress2).

Group 1 = Psychosocial Intervention Group
 Group 2 = Informational Comparison Group
 Group 3 = Non-treatment Control

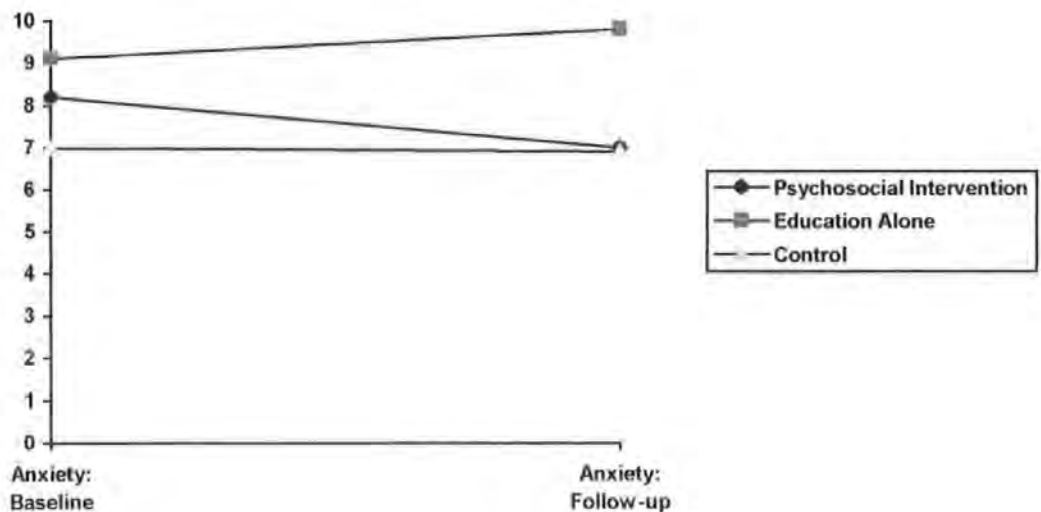
Anxiety

No significant results for anxiety were obtained for time by group $F(2,27) = 1.653$, $p > .210$, time $F(1,27) = .218$, $p > 0.05$, or group $F(2,27) = 1.319$, $p > 0.05$. The results are presented further in Table 14. Graph VI shows a trend for anxiety scores to reduce for the

psychosocial intervention group. Anxiety scores increased for the informational comparison group. Table 15 presents the means and standard deviations for these data. Since it was predicted that these differences would be significant, hypothesis 5 has not been supported by these findings.

	SS	DF	MS	F	Sig
Time	.600	1	.600	.218	.644
Error	74.300	27	2.752		
Time by Group	9.100	2,27	4.550	1.653	.210
Group	67.300	2	33.650	1.319	.284
Error	688.700	27	25.507		

Table 14 - Showing ANOVA results for Anxiety.



Graph VI - Showing a decrease in scores for anxiety for the psychosocial intervention group from baseline to follow-up, and an increase in anxiety scores for the informational comparison group.

Descriptive Statistics

	GROUP	Mean	Std. Deviation	N
ANX1	1.00	8.2000	4.6380	10
	2.00	9.1000	4.1218	10
	3.00	7.0000	2.6667	10
	Total	8.1000	3.8627	30
ANX2	1.00	7.0000	3.2660	10
	2.00	9.8000	3.9944	10
	3.00	6.9000	3.5418	10
	Total	7.9000	3.7449	30

Table 15 - Showing Means and Standard Deviations for Anxiety from Time 1 (Anx1) to Time 2 (Anx2).

Group 1 = Psychosocial Intervention Group

Group 2 = Informational Comparison Group

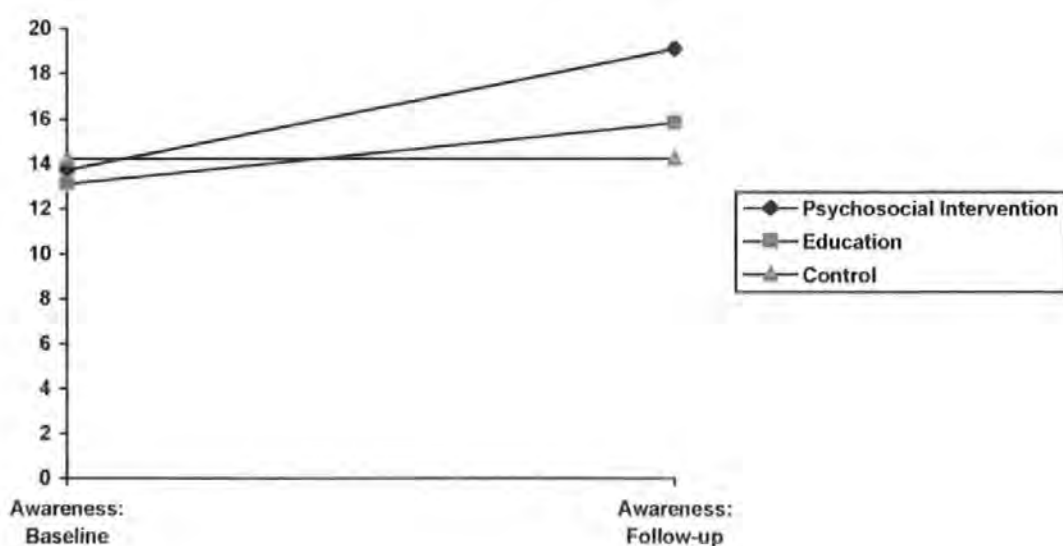
Group 3 = Non-treatment Control

Awareness about Osteoporosis

A highly significant result was obtained for awareness of osteoporosis for group by time $F(2,27) = 18.70$, $p < 0.001$, time $F(1,27) = 59.680$, $p < 0.001$, and group $F(2,27) = 3.313$, $p < 0.05$. These results are reported fully in Table 16. Graph VII shows that the psychosocial intervention group increased in awareness to a greater extent than the informational comparison group, and this difference was found to be significant when a t-test was applied to the data ($t = 3.123$, $df18$, $p < 0.05$). A significant difference was also found between the psychosocial intervention group and the non-treatment control group ($t = 5.057$, $df18$, $p < 0.001$), but not between the informational comparison group and the non-treatment control group ($t = 1.188$, $df18$, $p > 0.05$). Table 17 presents the means and standard deviations for these data. Hypothesis 6 predicted that there would be a significant increase in knowledge about osteoporosis post-intervention in comparison to the other two groups. Hypothesis 6 is therefore supported by these findings.

	SS	DF	MS	F	Sig
Time	112.067	1	112.067	59.680	.000
Error	50.700	27	1.878		
Time by Group	70.233	2,27	35.117	18.701	.000
Group	59.700	2	29.850	3.313	.052
Error	243.300	27	9.011		

Table 16 - Showing ANOVA results for Awareness of Osteoporosis



Graph VII - Showing a greater increase in awareness for the psychosocial intervention group than for the two control groups.

Descriptive Statistics

	GROUP	Mean	Std. Deviation	N
AWARE1	1.00	13.7000	1.8288	10
	2.00	13.1000	1.5951	10
	3.00	14.1000	2.7264	10
	Total	13.6333	2.0759	30
AWARE2	1.00	19.1000	1.1005	10
	2.00	15.8000	3.1552	10
	3.00	14.2000	2.8597	10
	Total	16.3667	3.2108	30

Table 17 - Showing Means and Standard Deviations for Awareness of Osteoporosis for Baseline (AWARE1) and Follow-up (AWARE2).

Group 1 = Psychosocial Intervention Group

Group 2 = Informational Comparison Group

Group 3 = Non-treatment control.

Age

The difference in scores from baseline to follow-up was calculated for each individual participant in all the three groups. These differenced scores were then analysed using bivariate correlational analysis. It can be seen from Table 18 that no relationship was observed between age and pain, depression, anxiety, internal locus of control, powerful doctor locus of control, chance happenings locus of control, or awareness of osteoporosis. These findings support hypothesis 7 which predicted that there would be no relationship between age of participants and any of the dependent measures.

Correlation	Group 1	Group 2	Group 3
Age with Pain Ratings	$r = -.246$ $N = 10$ $P > 0.05$	$r = -.241$ $N = 10$ $P > 0.05$	$r = .573$ $N = 10$ $P > 0.05$
Age with Internal Locus of Control	$r = -.189$ $N = 10$ $P > 0.05$	$r = .170$ $N = 10$ $P > 0.05$	$r = -.286$ $N = 10$ $P > 0.05$
Age with Powerful Doctor Locus of Control	$r = .309$ $N = 10$ $P > 0.05$	$r = -.150$ $N = 10$ $P > 0.05$	$r = -.205$ $N = 10$ $P > 0.05$
Age with Chance Happenings Locus of control	$r = .259$ $N = 10$ $P > 0.05$	$r = .156$ $N = 10$ $P > 0.05$	$r = .279$ $N = 10$ $P > 0.05$
Age with Depression	$r = -.090$ $N = 10$ $P > 0.05$	$r = .223$ $N = 10$ $P > 0.05$	$r = -.275$ $N = 10$ $P > 0.05$
Age with Anxiety	$r = -.036$ $N = 10$ $P > 0.05$	$r = .563$ $N = 10$ $P > 0.05$	$r = -.483$ $N = 10$ $P > 0.05$
Age with Awareness about Osteoporosis	$r = -.082$ $N = 10$ $P > 0.05$	$r = -.385$ $N = 10$ $P > 0.05$	$r = -.405$ $N = 10$ $P > 0.05$

Table 18 - Correlation Coefficients with Age as an independent measure, with Pain Ratings, Internal Locus of Control, Powerful Doctor Locus of Control, Chance Happenings Locus of Control, Anxiety, Depression, and Awareness of Osteoporosis as dependent measures.

Bivariate Correlation Analysis

Pearson Product Moment correlations were calculated in order to investigate possible relationships between independent measures (maladaptive and adaptive coping strategies), and outcome measures of depression, anxiety, pain ratings, and locus of control. For purposes of space, only significant results of theoretical interest are presented in Tables 19, 20, 21, and 22.

Independent Variable	Dependent Variables		
Adaptive Coping	Chance Happenings $r = -.578$ $N = 30$ $P < 0.01$	Powerful Doctor $r = -.490$ $N = 30$ $P < 0.01$ $=$	Pain Ratings $r = -.453$ $N = 30$ $P < 0.05$

Table 19 - Correlation Coefficients for Independent Measures of Adaptive Coping with Dependent Measures of Chance Happenings Locus of Control, Powerful Doctor Locus of Control, and Pain Ratings.

Independent Variable	Dependent Variable
Maladaptive Coping	Powerful Doctor $r = .383$ $N = 30$ $P = < 0.05$

Table 20 -Showing Correlation Coefficient for Maladaptive Coping with Powerful Doctor Locus of Control.

	Anxiety	Depression
Pain Ratings	$r = .393$ $N = 30$ $P = < 0.05$	$r = .555$ $N = 30$ $P = < 0.01$

Table 21 -Showing Correlation Coefficients for Pain Ratings with Anxiety, and Depression.

	Powerful Doctor
Chance Happenings	$r = .473$ $N = 30$ $P = <0.01$

Table 22 -Showing Correlation Coefficient for Chance Happenings Locus of Control with Powerful Doctor Locus of Control.

It can be seen from the above tables that a negative correlation was obtained between adaptive coping with chance happenings locus of control, powerful doctor locus of control, and pain ratings. A positive correlation existed between maladaptive coping, and powerful doctor locus of control, and between chance happenings locus of control and powerful doctor locus of control. Positive correlations were also obtained between pain ratings, and anxiety and depression.

Discussion

This study was undertaken in order to compare the effects of a psychosocial intervention, with a postal education package, on the way in which people cope with osteoporosis. Research has suggested that feelings of helplessness and loss of control are linked with poor adaptation to chronic illnesses such as osteoporosis in terms of pain perceptions, depression, and anxiety. A skills training package, focusing on education about the disorder, relaxation techniques and specific coping strategies, was delivered to a group of sufferers. Two other groups of osteoporosis sufferers took part in the study; one of these groups received an education booklet through the postal system, and the remaining group was a non-treatment control.

Pain

The intervention group reported significantly higher levels of pain at baseline than the other two groups. Despite this finding, the pain rating index (PRI) for the intervention group decreased significantly post-intervention in comparison to the other two groups, for whom pain ratings continued to rise. When looking at the dimensions of pain it was apparent that there were differences in pain experience between the groups, although the clinical significance of this finding remains unclear. A significant decrease in sensory pain occurred for the intervention group in comparison to the other two groups. Although similar trends were observed for affective and evaluative pain, the results for these two aspects of pain were not significant. These PRI findings, which measure global pain, support hypothesis 1 which predicts that self-reported pain would be significantly lower at follow-up for the intervention group than for the informational comparison group or the non-treatment control group.

It can be seen that, while the PRI demonstrates a significant decrease in pain for the intervention group compared to the other two groups, there are dimensions of pain for which the effect is more variable. This supports Melzack's (1973) view that pain is a complex, multidimensional experience with several interrelating components. Although some generalisations are possible, acknowledgement must also be made of individual characteristics regarding the pain experience. On the other hand, when studying groups, it may not be realistic to split the pain experience up into specific dimensions. The PRI measures global pain, while the dimensions measure specific pain. The findings here suggest that both physical and emotional dimensions of pain differed between the groups at follow-up. It is, however, debatable whether or not these results are entirely valid. Since it is acknowledged that there is a great deal of individual variation in the experience of pain, the global measure in the PRI provides the most useful generalisation about pain experienced in a group of patients.

As already discussed, certain approaches which are popular with some clinics may not be appropriate for osteoporosis sufferers. For example, a cognitive-behavioural approach using graded exercise for chronic pain could place the osteoporosis sufferer at a disadvantage in view of the increased risk of spontaneous fracture in advanced stages of the disease. Many physiotherapists decline to treat people with osteoporosis for this reason. The ideal answer is, of course, wide availability of diagnostic equipment so that those at risk can be identified and treated while the bones are still strong enough to tolerate and benefit from exercise. Regular weight-bearing exercise, such as walking, can build bone provided sufferers are not so severely disabled that they are no longer able to engage in this activity. The increased risk of fracture in osteoporosis means that many activities sufferers once enjoyed are no longer realistically achievable.

Operant approaches were not employed in the present study, since they are of questionable merit when treating osteoporosis sufferers whose pain serves to protect them from further fracture. Some pain behaviours exhibited by osteoporosis sufferers may therefore be adaptive rather than maladaptive. The theory put forward by Phillips (1987a), which states that pain behaviour is avoidance behaviour which serves to maintain the original pain problem, cannot easily be applied to osteoporosis sufferers. In view of the adaptive nature of pain avoidance behaviour in osteoporosis, encouraging too great a change in this behaviour may be unrealistic and inadvisable.

No doubt an operant approach (which seeks to ignore pain behaviours and thereby render them extinct) would be capable of teaching osteoporosis sufferers to report less pain. It is debatable, however, whether fewer reports of pain and distress resulting from operant techniques, would mean that less pain and distress are actually being experienced. It may merely be the case that the disapproval of others results in the sufferer no longer conveying these feelings to others for fear of rejection from those upon whom they rely. The tendency for people to under or over-report problems in an attempt to please the experimenter is a well known phenomenon which exemplifies this process. One difficulty faced by people suffering from chronic pain is that there exists no socially acceptable language for communicating it to others. Since pain cannot be objectively observed by any other means, the only evidence for its existence is the sufferers verbal and non-verbal communication. The disclosure of pain can therefore result in the sufferer being stigmatised and marginalised, due to the suspicion of non-sufferers regarding its legitimacy. The McGill Pain Questionnaire used in this study represents a step in the right direction towards providing a socially acceptable linguistic device that allows sufferers to accurately convey their subjective experience of pain. Many medical procedure and

treatment plans are based on information from the patient regarding the nature and intensity of their pain. Before employing techniques which condition chronic pain sufferers out of employing their only known means of communicating the pain experience, it may therefore be important to offer them alternative, acceptable means to convey it.

Locus of Control

Significant changes between the three groups for internal locus of control occurred following the intervention. Internal locus of control (which represents the extent to which individuals perceive future events to be within their personal control) increased significantly more for the intervention group than for the informational comparison group, which showed a decrease. The non-treatment control group remained stable. These results, which are consistent with hypothesis 2, demonstrate that a psychosocial intervention consisting of an education component, cognitive skills training, and relaxation, is capable of increasing internal locus of control more effectively than postal education. The prediction that external locus of control (subdivided into powerful doctor, and chance happenings) would decrease significantly for the intervention group, whilst increasing or remaining stable for the informational comparison group, and for the non-treatment control group, is not supported by the data. Nevertheless, there was a trend towards both the intervention group and the informational comparison group to increase in powerful doctor locus of control, whilst a decrease occurred for the non-treatment control group. Although chance happenings locus of control decreased for the intervention group and increased for the other two groups, these findings were not significant. Hypothesis 3, which predicted that this difference would be significant, is therefore not supported by the data.

Although the groups started out differently in terms of external locus of control at baseline, there were no significant differences at this stage between the psychosocial intervention group, and the informational comparison group regarding powerful doctor locus of control. The differences lay between the psychosocial intervention group and the non-treatment control group; and also between the informational comparison group and the control group.. For chance happenings locus of control, the difference was between the psychosocial intervention group and the informational control group. If a larger sample of participants had been used in this study, the differences at baseline would probably not have been significant. A larger sample may also have affected the results for locus of control at follow-up. Although the changes seen on graph III suggest a trend towards both the intervention group and the informational comparison group to increase in powerful doctor locus of control, and graph IV suggests a decrease in chance happenings locus of control for the psychosocial intervention group, the implications of these findings remain unclear. Some possible explanations for the findings will now be discussed.

The trend towards increased powerful doctor locus of control for the psychosocial intervention group post-intervention is an interesting one, given that this group also increased in knowledge about the disorder, and decreased in depression, anxiety, and pain ratings. As previously discussed, some authors suggest that an external locus of control orientation can result in poorer psychosocial outcomes (Chapman & Jeffrey, 1979; Williams, 1993; Sands, 1978; Kubel, 1976; White, 1981). However, the work of Christensen (1991) discovered that significantly lower depression was associated with locus of control beliefs oriented toward the existence of an instrumental control agent (either personal control, or control by powerful others). The results obtained in the present study lend partial support to evidence presented by Burish et al (1984), and Jamieson et al (1978), that more positive adjustment is associated with external locus of control.

Although the increase in powerful doctor external control in the present study was not significantly different at follow-up than the other two groups, the fact that an increase did take place may indicate that an external locus of control belief is not necessarily maladaptive. This suggestion runs counter to contradictory findings that an external control belief is associated with negative reactions to physical illness (Chapman & Jeffrey, 1979; White, 1981). The contradictory findings in studies could be interpreted as an indication that a balance between external and internal locus of control is more adaptive than a rigid belief in either.

Two possible hypotheses therefore emerge from the results obtained in this study regarding locus of control. On the one hand it may be predicted that an increase in powerful doctor locus of control is a means of relinquishing responsibility; on the other, it may be interpreted as an indication of the potential for collaborative co-operation. It may be the case that internal locus of control, and powerful doctor locus of control are complementary, rather than oppositional. It is not possible from the present data to decide between these alternatives. However, one possibility that is consistent with the findings is that an ability to move flexibly between internal locus of control beliefs, and external beliefs in the control of powerful others, depending on the particular situation, is likely to result in better adaptation to illness. Rotter's (1966) contention that either extreme is likely to be pathological is consistent with the present findings. The appeal of this explanation for the present data is that it may account for the other changes that occurred which cannot easily be interpreted in terms of relinquished control (i.e. pain, depression, anxiety).

These findings have clinical relevance for psychological interventions with osteoporosis sufferers. Control beliefs that may be maladaptive or irrational in a particular situation may be amenable to change. Chronically ill people such as osteoporosis sufferers, who

face an uncontrollable and uncertain health outcome, may benefit from being guided to identify, and focus efforts upon, aspects of the illness which are more controllable. Coping strategies requiring instrumental action, the results of which are uncontrollable, may be less adaptive in some situations than emotion-focused strategies which assist individuals to cope with the emotional demands associated with incurable, deteriorating conditions.

The extent to which control beliefs are congruent with objective evidence may be an important factor in determining how adaptive these beliefs will be. With osteoporosis, the course of the disorder and its effects are unpredictable, and may be different for each individual sufferer. In the area of prevention, some sufferers may follow all the guidelines and yet still develop the disorder as a result of the genetic component, or other uncontrollable, predisposing factors. Once it has developed, some may continue to deteriorate and suffer multiple and disabling fractures despite following all medical and lifestyle advice. A certain element of luck regarding the development and progression of the disorder cannot, therefore, be denied. Many of the available treatments for osteoporosis can result in distressing side effects which some people find so intolerable that the treatment has to be discontinued. For example, the drug Fosamax (a bisphosphonate) can cause bleeding from the digestive system; and hormone replacement therapy has been found to increase the risk of prostate cancer in men, and deep vein thrombosis in women. Whether or not an individual will suffer such side effects is largely down to luck.

Osteoporosis sufferers are clearly not an homogeneous group; there may exist a number of subtypes of the disorder depending upon causality and probable course, in addition to personality factors. Group intervention may need to take into account this variability between osteoporosis sufferers. Serious attempts to identify different subtypes need to be made as early as possible so that psychological intervention packages can be tailored

accordingly. A more severe, genetically determined subtype may not be amenable to psychological interventions which attempt to give sufferers a greater sense of perceived control over the disorder by emphasising the role of health behaviours in determining its development and course. Such an approach could be counter-productive, in that it may result in unwarranted self-blame in cases where osteoporosis would have developed and become severe despite good health behaviours. There is also a subtle line to be drawn between empowering sufferers, and giving them a false sense of controllability by instrumental control agents. Such false hope may be vulnerable to disconfirmations, and later lead to a greater sense of hopelessness and disillusionment, therefore making clients worse rather than better. A sense of exaggerated optimism can only work for as long as this optimism is confirmed by events. If personal efforts fail, internal locus of control may cease to be adaptive and become maladaptive, resulting in clients feeling 'sadder but wiser' (Alloy & Abramson, 1979). A balance must therefore be struck between realism and optimism, with perhaps a degree of both needing to be engendered. A distinction must, however, be made between chronic, incurable diseases, such as osteoporosis, and other physical or emotional disorders for which the prognosis is good. A different set of coping responses may be required depending upon the long term prognosis of the particular disorder. Osteoporosis sufferers, in common with other chronic and potentially distressing illnesses such as schizophrenia, may need to be encouraged to let go of strong beliefs regarding the ability of healthcare professional to cure them, but to retain or develop optimism concerning their ability to manage certain aspects of the disorder.

Depression

A significant decrease in depression from baseline to follow-up took place for the intervention group compared to the other two groups. These results cannot be explained in terms of group differences at baseline, since these were found not to be significant. In view

of the increase in internal locus of control for the intervention group, these findings lend some support to Seligman's (1975) theory of learned helplessness which links depression with a perception of no control. The findings also lend some support to Presson and Benassi's (1996) conclusions that a greater belief in chance happenings and powerful others' control is associated with higher scores on measures of depression. In view of the decreased depression and pain ratings post-intervention, together with increased internal locus of control for the intervention group, the findings lend some support to the notion of a relationship between internal locus of control and psychological adaptation to chronic pain. It could be speculated that these findings indicate that internal locus of control plays a significant role in moderating depression, since internal locus of control also increased significantly for the psychosocial intervention group. Such an argument is convergent with similar findings previously reported by Raynaart et al (1995), and Kugler (1994). The level of reported depression at baseline for the three groups was, however, below that required for a clinical diagnosis of depression. A number of explanations may be put forward for this. Firstly, the possibility exists that depressive symptomatology is not a particular problem for osteoporosis sufferers. A second possibility is that those sufferers who are the most severely affected by the disease may have declined to take part in the research due to mobility problems, or lack of motivation as a result of depression. It seems likely that disease severity would be associated with a series of failed medical treatments, resulting in continued bone loss and deterioration in physical and psychological functioning. In line with Christensen's (1991) findings, it could be speculated that, when faced with failed treatment, internality could result in greater levels of depression in people with severe osteoporosis. Such phenomena may have been missed in the present study as a result of the sample of osteoporosis sufferers being too small in number, and not necessarily representative of sufferers as a whole. These possibilities make any generalisations from the present findings regarding depression problematic.

Anxiety

Anxiety scores on the HADS for the psychosocial intervention group, and for the informational comparison group indicated mild anxiety for these groups at baseline. At follow-up, anxiety scores for the psychosocial intervention group fell below the threshold for anxiety, a result which can be seen to be of some clinical relevance. No such improvement can be observed for the informational comparison group. It is possible that the follow-up period in this study was not sufficiently long enough to detect changes over time. Participants in the psychosocial intervention group may have continued to progress regarding anxiety as a result of practising the relaxation techniques contained on the tape recording they were provided with. A longer follow-up period, may have yielded more significant results in this area.

No significant decrease in anxiety was obtained for the intervention group compared to the informational comparison group and the non-treatment control group. There was, however, a trend for anxiety to decrease for the psychosocial intervention group, and to increase for the informational comparison group. These findings draw attention to the theory that providing information can result in increased anxiety levels (Langer, Janis & Wolfer 1975). It could, however, be speculated that the trend towards the psychosocial intervention group to decrease in anxiety is an indication that the way in which information is communicated is the important factor in determining whether anxiety will, or will not result. This possibility will be considered in further detail in the following discussion of the data obtained from the awareness questionnaire used in this study.

Awareness of Osteoporosis

Disease knowledge post-intervention was found to be significantly different between the three groups. The groups did not differ significantly regarding knowledge at baseline. Although both the intervention group and the informational comparison group increased in knowledge, the intervention group increased significantly more. Knowledge about the disorder remained stable for the non-treatment control group. These findings suggest that information sent to sufferers through the post, or handed out in clinics, may not be as effective in increasing knowledge, as education delivered on an individual basis as part of a skills-training package. Since anxiety, pain and depression rose for the group receiving postal education, this may be a counter-productive way of imparting information to osteoporosis sufferers.

These findings have serious implications for the way in which information regarding the disorder is delivered to sufferers in the future. The distribution of leaflets to people attending outpatient clinics may, at present, be regarded as a cost effective and simple way in which to offer information to osteoporosis sufferers. The implications of the present research findings are that it is more effective to deliver education in a supportive environment on an individual basis, in a manner which allows the sufferer to seek clarification on any issues which they do not entirely comprehend, and to obtain reassurance and support regarding those issues which evoke certain fears or anxieties for them. An attempt to address such issues has been made by the National Osteoporosis Society (NOS) who, in addition to providing written information to members, offer access to support groups which enable an exchange of information between sufferers. However, these self-help groups are run on a voluntary basis by osteoporosis sufferers who, despite high levels of commitment, may lack the expertise and training to address the

psychological needs of their members. In addition, the most severely disabled individuals are unlikely to be able to negotiate public transport in order to attend meetings, and some may be unable to afford the yearly subscription to the NOS. There exists a strong possibility that the psychological needs of osteoporosis sufferers are not being adequately met. A cost effective method of identifying and delivering psychological care to the most needy osteoporosis sufferers who are unable to take advantage of other sources of support, urgently needs to be developed.

There is some concern amongst health care professionals that the provision of information can result in raised anxiety levels. These concerns are based on research findings that giving people information pre-operatively does not always result in favourable outcomes (Langer, Janis, and Wolfer, 1975; Miller & Mangon, 1983). It may, however, be the case that the chronic problems faced by osteoporosis sufferers are fundamentally different from the acute but transient stress of facing surgical procedures. Such procedures inevitably carry with them some level of anticipatory anxiety which may be exacerbated by having the procedure and its effects explained in detail. With osteoporosis, the aim of education is to equip the individual with the knowledge they need in order to gain a measure of control over the chronic problems associated with it. Since the control during surgical procedures is in the hands of healthcare professionals, and not the individual, perceived control may therefore be the key factor which determines the way in which information will affect psychological functioning. Drawing parallels between anxiety experienced pre-operatively in response to receiving information, and osteoporosis sufferers' responses to receiving education about their disorder, may not be realistic in view of the present findings.

The provision of distressing information (e.g. regarding painful side effects of medical procedures) in a situation where the individual is not in a position to make good use of it

for their own benefit, may well be detrimental to some individuals in some circumstances. Factors such as personality, social support systems, and repertoire of coping skills, may also have an important role to play in whether or not information will be beneficial or detrimental. The present research findings suggest that it would be premature to abandon altogether the idea of providing chronically ill people such as osteoporosis sufferers with education regarding their illness. Such an approach, though obviously based on concern for the patients psychological well-being, can be seen as being a rather paternalistic one which threatens to disempower sufferers by depriving them of choices and placing them in a position of ignorance and dependency. The rationale for providing information to sufferers is that information-seeking is an active coping strategy which may be capable of providing individuals with higher levels of perceived control by equipping them with a comprehensive understanding of the disorder from which they suffer, and enlightening them as to the different pharmacologic and nonpharmacologic methods available to them. The increase in internal locus of control for the group receiving a psychosocial intervention with an education component, in addition to improvements for this group in terms of depression, anxiety, and pain ratings, lends support to previous findings that perceived control may be the most important influencing factor in adaptation to chronic illness (Spence, 1992).

The results also lend some credence to the findings of DiVillis (1980) which suggested that internal locus of control is associated with a greater motivation to be more actively involved in personal health. In order for sufferers to be actively involved in their own health, they need to be as fully informed as possible regarding the nature of the disorder, and possible solutions to, or ways of coping with, the problems it presents. On the other hand it would not be advisable to thrust information upon sufferers who do not desire it. A sensible approach would be to thoroughly assess osteoporosis sufferers on an individual

basis in order to ascertain whether or not they desire more information, and if so, how much , and on which particular topics. Offering people such choices would enable individual differences to be taken into account.

Age

The age of participants in the study had no effect upon the way in which they were able to benefit from the psychosocial intervention. These findings lend support to extensive research by Middaugh et al, (1988); Puder, (1988); Coenda & Dougherty, (1990); and Keefe & Williams (1990) which has shown that older adults are as capable of utilising a programme of pain management as their younger counterparts. Age had no influence on pain, depression, locus of control, or awareness of osteoporosis post-intervention. There appears to be no valid reason why older adults with osteoporosis should not have access to future self-training programmes consisting of an education component.

As the population of older adults increases, the prevalence of diseases such as osteoporosis are likely to rise accordingly. The over 50's age group already make up the largest proportion of sufferers, and the present trend for women to live longer than men will result in large increases in post-menopausal women with the disease. It is essential that the practice of discriminating against older adults regarding access to pain management clinics is ended. It may be the case that the clinics of the future will be required to adapt and alter according to the needs of the growing elderly population suffering from osteoporosis.

Adaptive and Maladaptive Coping

Both chance happenings and powerful doctor locus of control beliefs were found to be negatively correlated with adaptive coping. A positive correlation was obtained between chance happenings and powerful doctor locus of control, suggesting that these two

subdivisions of external locus of control are associated. No such association was found between internal locus of control, and either chance happenings or powerful doctor beliefs. A tentative suggestion from these findings is that the greater the belief in external locus of control regarding future pain, the less likely the individual is to utilise adaptive coping strategies to manage it. This argument is further strengthened by the finding that maladaptive coping was positively correlated with powerful doctor locus of control. Since these results are purely correlational, the converse could also be argued. However, adaptive coping was also negatively correlated with pain ratings, which were positively correlated with anxiety and depression. These results suggest that there exists a complex interaction between preferred coping strategies, locus of control, pain, depression, and anxiety. No categorical statement regarding causality is, however, possible from these correlational data.

The present study offers some evidence for the effectiveness of a psychosocial intervention consisting of individually delivered education, in improving the quality of life of osteoporosis sufferers. The research findings suggest that the dichotomisation of individuals into 'internals' and 'externals' is not a realistic one. Locus of control is clearly not a stable construct, but is amenable to change depending upon the situation. More research in this area is urgently needed so that future findings can guide clinical practice and identify the most essential ingredients necessary for the osteoporosis clinics of the future. It is of the highest importance to ensure that such clinics do not jeopardise the psychological and physical well-being of sufferers further by imposing inappropriate approaches to therapy which may have proven efficacy for other disorders, but not for osteoporosis. The possibility exists that the complexity of osteoporosis and its associated problems, render it a fundamentally different disorder from other chronic pain conditions. In the future development of effective treatment packages for osteoporosis sufferers,

caution is needed before making any direct parallels between the disorder under scrutiny, and other chronic pain conditions.

In conclusion, a number of indications emerge from the present research findings. Firstly, locus of control may be amenable to change depending upon the situation, and may be associated with pain, depression, anxiety, and maladaptive and adaptive coping strategies in osteoporosis. Secondly, a psychosocial intervention consisting of an education component is capable of increasing disease knowledge more effectively than a postal education package. Most importantly, the way in which education is delivered is an important factor involved in whether it will be of benefit to individuals in terms of perceived control, pain, anxiety, and depression. From the present findings, there is nothing to suggest that the provision of information is detrimental, provided it is delivered in a sensitive, supportive manner, and on an individual basis. The education booklet in this study contained information and guidance on the use of different strategies for stress and pain management, and could therefore be considered to be a psychological approach. What is highlighted by this study is that the way in which it is delivered may well be the most important factor in its efficacy. The uniqueness of each sufferers' situation, together with their idiosyncratic responses to the disorder, demand an approach which is specially tailored to, and guided by, the stated needs and preferences of the individual sufferer. The approach used in the present study has attempted to address this important issue.

A further implication of the research findings is that older adults with osteoporosis are just as likely to benefit from psychosocial intervention with an education component as their younger counterparts. Older adults with osteoporosis appear to be a low priority group where health care is concerned. In the absence of early detection and treatment, it is therefore essential that psychology services do not similarly neglect this client group.

Critique

Since criteria for inclusion in the study was that participants had sustained at least one vertebral fracture (indicative of advanced osteoporosis), an assumption was made that the sample was roughly similar in terms of symptomatology and severity. Such an assumption could be regarded as a flaw in this research, and could be controlled for in future research by properly matching the groups for severity.

One criticism which could be levelled at the present study is that the clarity and readability of the education booklet was not properly determined before its use. Anecdotal evidence in the form of feedback from participants at follow-up suggests that the booklet was attractively presented, and expressed simply enough in layman's terms to enable sufferers to understand and absorb its contents. Those participants who were given an opportunity to discuss its contents within the context of the therapeutic relationship appeared to benefit fully from the information contained in it. It may be the case that those receiving it through the post lacked the motivation to scrutinise its contents in the absence of a supportive therapeutic atmosphere. Although the booklet was assessed by presenting it to medical staff and psychologists, and gaining comments from them, it would perhaps have been more informative to investigate the views of osteoporosis sufferers more thoroughly before using it in this study.

Physical limitations were not measured in this study, and this decision could be criticised as a neglect of an important factor involved in osteoporosis. The reasons for this omission are worthy of brief discussion. Inadequate access to monitoring equipment, and unpredictable levels of drug therapy success, mean that prognosis for osteoporosis remains poor. Given the nature of the disorder under scrutiny, a gradual deterioration in mobility and ability to perform tasks of daily living is highly probable, and unlikely to be alleviated

by psychological approaches. Despite an increasing number of new drugs trials being undertaken, the future progression of the disorder for the individual sufferer remains uncertain. It is, perhaps, this chronic uncertainty regarding future pain and disability which is at the very core of psychosocial problems. To measure physical disability was therefore not seen as a priority of the present study, the main focus of which is psychological effects and their alleviation. If this can be achieved in the face of inevitable deteriorations in physical health, and the absence of a cure for osteoporosis, a worthwhile contribution to improved quality of life may become possible.

In common with previous studies which have included several components, the present study fails to determine which component or combination of components is likely to be the most effective in aiding osteoporosis sufferers to adapt to the many facets of the disorder. It may be the case that education alone is the key factor capable of improving outcome in the absence of any other therapeutic approach, provided it is delivered during face to face contact. Although the inclusion of passive muscle relaxation, and coping skills training in this study have tended to confound the results regarding the effectiveness of the education component, the efficacy of the package as a whole makes intuitive sense since it addresses many of the adverse effects of the disorder (e.g. pain, depression, anxiety), and offers coping skills to deal with them. It was felt that an education package could not be ethically produced which isolated information about the disorder from information regarding how to develop strategies to cope with it. Such a booklet would merely state the bald medical facts about the disorder, neglecting the individual's personal experience and management of it.

The intervention involved in this study was labour intensive and time consuming, and therefore limited the number of participants involved. Reliability and validity of the findings could have been increased if a larger sample had been possible.

Future Research

Although some important implications emerge from this study, further research is needed in order to verify the findings. Future investigations need to involve a larger sample size, and properly pre-test and match participants for severity on all measures.

It may be necessary, given the disability caused by severe osteoporosis, together with its possible association with failed treatments and depression, for future research to be carried out in the community in order to ensure that access is gained to the most severely affected sufferers. Restraints regarding time and resources precluded such procedure in the present study.

The purpose of the present study was to compare the effects of a psychosocial intervention package containing an education component, with an education package sent through the post. Further research is now needed in order to examine the process of therapy, and identify the most effective components of it for osteoporosis sufferers. The design of such research would need to include an attention placebo control group, and compare this with an intervention group, and an informational comparison group. As previously discussed, there would be some ethical implications with such a design. These could be overcome by applying the interventions in sequence to all the groups involved, and measuring at each stage, therefore ensuring that all participants benefit from the intervention, and from the provision of information.

Some rich, qualitative data may have been lost in this study in favour of a focus upon objectively measurable factors. For example, a number of sufferers in the psychosocial intervention group discussed at length their deep sense of loss regarding activities such as gardening, carrying shopping, performing housework tasks, or travelling on public transport. Despite a low level of depressive symptomatology obtained on the HADS, eight of the ten sufferers in the intervention group wept openly whilst discussing these losses during therapy sessions. One man in particular cried uncontrollably whilst attempting to explain his distress at not being capable of lifting his infant grandson. Such profoundly personal reactions are difficult to quantify, and may only be properly assessed and understood through a qualitative approach to research. Such an approach can be seen to have some empathy with Gold's (1991) observations regarding the 'invisible psychosocial scars' of osteoporosis.

PATIENT INFORMATION SHEET

The purpose of this research is to examine ways in which people may be helped to cope with Osteoporosis.

If you agree to take part in the study you will be asked to complete a questionnaire booklet on two occasions. You will also be given a book containing information about coping with Osteoporosis. You may also be invited to attend a clinic at the Rheumatology Department at City Hospital, Truro for up to four sessions with a psychologist. This study is not a drug trial, so you will not be asked to alter your current medication in any way.

Any records that identify you will be kept confidential. No names will be mentioned in the write-up of the research, and you will not be identified by any other means.

You will be free to withdraw from the research at any time without giving a reason, and without prejudicing your care or jeopardising your relationship with the medical staff.

APPENDIX 2

CONSENT FORM

Charlotte Davenport Clarke (Trainee Clinical Psychologist) has fully explained the nature of this research to me. I agree to take part in the study provided that confidentiality is maintained regarding any information I provide. It has been explained to me that if I wish to do so, I may withdraw from the study at any time. Whether or not I decide to withdraw will not prejudice in any way the treatment I have been receiving. ,

Signed:

Name:

Date:

APPENDIX 3 - QUESTIONNAIRE BOOKLET

OSTEOPOROSIS AWARENESS QUESTIONNAIRE

Please complete the following questionnaire about Osteoporosis by circling either TRUE or FALSE after each question.

1. Osteoporosis is a disease which causes bones to become thinner.

TRUE FALSE

2. Osteoporosis only affects women.

TRUE FALSE

3. Osteoporosis often runs in families.

TRUE FALSE

4. Osteoporosis is just a normal part of ageing.

TRUE FALSE

5. Poor diet may lead to Osteoporosis.

TRUE FALSE

6. Osteoporosis can be caused by too much sunshine.

TRUE FALSE

7. Osteoporosis is rarely painful.

TRUE FALSE

8. A history of few or irregular periods can lead to Osteoporosis.

TRUE FALSE

9. Women who have gone through the menopause late in life are more likely to have Osteoporosis.

TRUE FALSE

10. Smoking cigarettes can cause Osteoporosis.

TRUE FALSE

11. Moderate, regular exercise is good for Osteoporosis.

TRUE FALSE

12. Women who have gone through the menopause early in life are more likely to develop Osteoporosis.
TRUE FALSE
13. Immobility can cause Osteoporosis.
TRUE FALSE
14. Loss of height can be a sign of Osteoporosis.
TRUE FALSE
15. Osteoporosis only develops in old age.
TRUE FALSE
16. Drinking alcohol to excess can result in the development of Osteoporosis.
TRUE FALSE
17. Calcium and vitamin D in the diet can help prevent Osteoporosis.
TRUE FALSE
18. Excessive exercise is bad for the bones.
TRUE FALSE
19. There is no treatment that helps Osteoporosis once it has developed.
TRUE FALSE
20. Osteoporosis cannot be prevented.
TRUE FALSE

Adapted from questionnaires designed by the Osteoporosis Society, and the Co-ordinator of the Stockport Osteoporosis Society Support Group.

FOLD HERE

FOLD HERE

Clinicians are aware that emotions play an important part in most illnesses. If your clinician knows about these feelings he or she will be able to help you more.

This questionnaire is designed to help your clinician to know how you feel. Read each item below and underline the reply which comes closest to how you have been feeling in the past week. Ignore the numbers printed at the edge of the questionnaire.

Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long, thought-out response.

A		D		A		D	
3	I feel tense or 'wound up'				I feel as if I am slowed down		3
2	Most of the time				Nearly all the time		2
1	A lot of the time				Very often		1
0	From time to time, occasionally				Sometimes		0
	Not at all				Not at all		
0	I still enjoy the things I used to enjoy				I get a sort of frightened feeling like		0
1	Definitely as much				'butterflies' in the stomach		1
2	Not quite so much				Not at all		2
3	Only a little				Occasionally		3
	Hardly at all				Quite often		
					Very often		
3	I get a sort of frightened feeling as if				I have lost interest in my appearance		3
2	something awful is about to happen				Definitely		2
1	Very definitely and quite badly				I don't take as much care as I should		1
0	Yes, but not too badly				I may not take quite as much care		0
	A little, but it doesn't worry me				I take just as much care as ever		
	Not at all						
0	I can laugh and see the funny side of things				I feel restless as if I have to be on		0
1	As much as I always could				the move		1
2	Not quite so much now				Very much indeed		2
3	Definitely not so much now				Quite a lot		3
	Not at all				Not very much		
					Not at all		
3	Worrying thoughts go through my mind				I look forward with enjoyment to things		3
2	A great deal of the time				As much as I ever did		2
1	A lot of the time				Rather less than I used to		1
0	Not too often				Definitely less than I used to		0
	Very little				Hardly at all		
3	I feel cheerful				I get sudden feelings of panic		3
2	Never				Very often indeed		2
1	Not often				Quite often		1
0	Sometimes				Not very often		0
	Most of the time				Not at all		
0	I can sit at ease and feel relaxed				I can enjoy a good book or radio or		0
1	Definitely				television programme		1
2	Usually				Often		2
3	Not often				Sometimes		3
	Not at all				Not often		
					Very seldom		

Now check that you have answered all the questions

TOTAL

A	D

McGILL PAIN QUESTIONNAIRE



.....

.....

.....

.....

.....

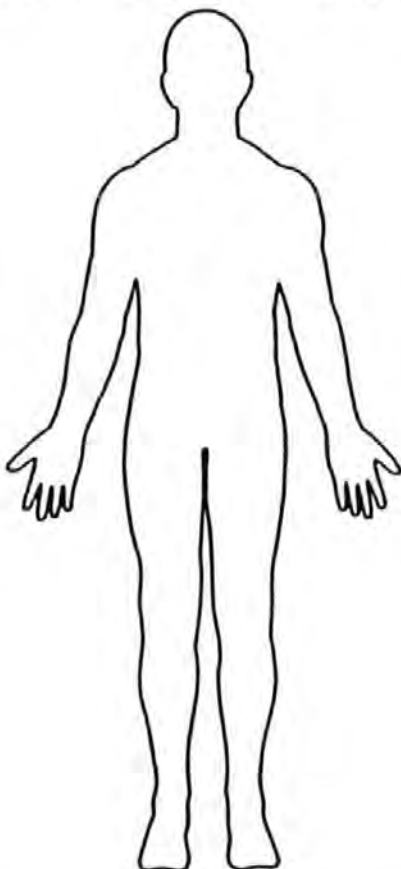
This questionnaire has been designed to tell us more about your pain. Four major questions we ask are:

- 1. Where is your pain?
- 2. What does it feel like?
- 3. How does it change with time?
- 4. How strong is it?

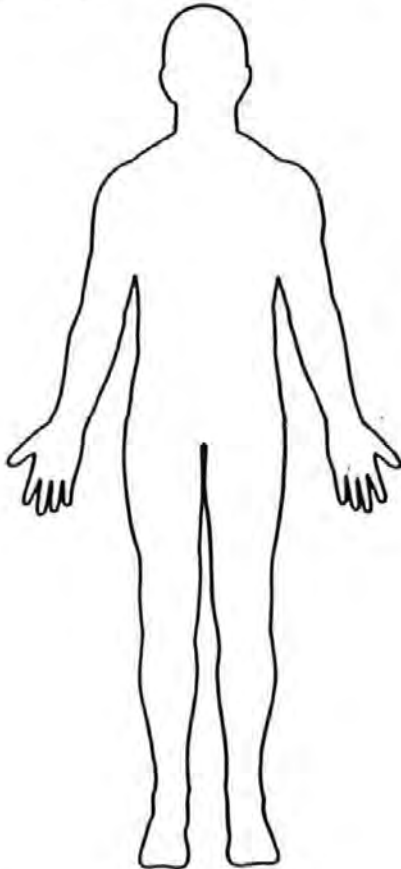
It is important that you tell us how your pain feels now. Please follow the instructions at the beginning of each part.

Part 1. Where is your pain?

Please mark, on the drawing below, the areas where you feel pain. Put E if external, or I if internal, near the areas which you mark. Put EI if both external and internal.



FRONT



BACK



Some of the words below describe your *present* pain. Circle *ONLY* those words that best describe it. Leave out any category that is not suitable. Use only a single word in each appropriate category – the one that applies best.

1 Flickering Quivering Pulsing Throbbing Beating Pounding	2 Jumping Flashing Shooting	3 Pricking Boring Drilling Stabbing Lancinating	4 Sharp Cutting Lacerating
5 Pinching Pressing Gnawing Cramping Crushing	6 Tugging Pulling Wrenching	7 Hot Burning Scalding Searing	8 Tingling Itchy Smarting Stinging
9 Dull Sore Hurting Aching Heavy	10 Tender Taut Rasping Splitting	11 Tiring Exhausting	12 Sickening Suffocating
13 Fearful Frightful Terrifying	14 Punishing Gruelling Cruel Vicious Killing	15 Wretched Blinding	16 Annoying Troublesome Miserable Intense Unbearable
17 Spreading Radiating Penetrating Piercing	18 Tight Numb Drawing Squeezing Tearing	19 Cool Cold Freezing	20 Nagging Nauseating Agonizing Dreadful Torturing

Part 3.

How does your pain change with time?

1. Which word or words would you use to describe the *pattern* of your pain?

1
Continuous
Steady
Constant

2
Rhythmic
Periodic
Intermittent

3
Brief
Momentary
Transient

2. What kind of things *relieve* your pain?

3. What kind of things *increase* your pain?

Part 4.

How strong is your pain?

People agree that the following 5 words represent pain of increasing intensity. They are:

1
Mild

2
Discomforting

3
Distressing

4
Horrible

5
Excruciating

To answer each question below, write the number of the most appropriate word in the space beside the question.

1. Which word describes your pain right now?

2. Which word describes it at its worst?

3. Which word describes it when it is at its least?

4. Which word describes the worst toothache you ever had?

5. Which word describes the worst headache you ever had?

6. Which word describes the worst stomach-ache you ever had?

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PAIN QUESTIONNAIRE (BPCQ)



Name:

Date: Record Number:

Here are some opinions which people sometimes hold about pain. I would like you to read them carefully and show me how much you agree or disagree with each one by ticking one of the numbers for each question. There are no right or wrong answers; I am interested in your views.

	1	2	3	4	5	6
1. If I take good care of myself, I can usually avoid pain.						
2. Whether or not I am in pain in the future depends on the skill of the doctors.						
3. Whenever I am in pain, it is usually because of something I have done or not done.						
4. Being pain-free is largely a matter of luck.						
5. No matter what I do, if I am going to be in pain, I will be in pain.						
6. Whether or not I am in pain depends on what the doctors do for me.						
7. I cannot get any help for my pain unless I go to seek medical help.						
8. When I am in pain I know that it is because I have not been taking proper exercise or eating the right food.						
9. Whether or not people are in pain is governed by accidental happenings.						
10. People's pain results from their own carelessness.						
11. I am directly responsible for my pain.						
12. Relief from pain is chiefly controlled by the doctors.						
13. People who are never in pain are just plain lucky.						
IS <input type="checkbox"/> PD <input type="checkbox"/> CH <input type="checkbox"/>	1	2	3	4	5	6

Strongly Disagree Disagree Middy Disagree Middy Agree Strongly Agree

© Harwood Academic Publishers GmbH, 1990. From 'A standardised scale to measure beliefs about controlling pain (BPCQ): a preliminary study', *Psychology and Health*, 4, 221-32. Reproduced with the kind permission of the author, S. M. Skevington and the publishers.

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Code 4920 02 4



Name:

Date: Record Number:

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Then respond to each of the following items by choosing one number for each, using the response choices listed just below.

- 1 = I usually don't do this at all.

2 = I usually do this a little bit.

3 = I usually do this a medium amount.

4 = I usually do this a lot.

Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no 'right' or 'wrong' answers, so choose the most accurate answer for YOU – not what you think 'most people' would say or do. Indicate what YOU usually do when YOU experience a stressful event.

1. I try to grow as a person as a result of the experience.

2. I turn to work or other substitute activities to take my mind off things.

3. I get upset and let my emotions out.

4. I try to get advice from someone about what to do.

5. I concentrate my efforts on doing something about it.

6. I say to myself "this isn't real".

7. I put my trust in God.

8. I laugh about the situation.

9. I admit to myself that I can't deal with it, and give up trying.

10. I restrain myself from doing anything too quickly.

11. I discuss my feelings with someone.

12. I use alcohol or drugs to make myself feel better.

13. I get used to the idea that it happened.

14. I talk to someone to find out more about the situation.

15. I keep myself from getting distracted by other thoughts or activities.

16. I daydream about things other than this.

17. I get upset, and am really aware of it.

18. I seek God's help.

19. I make a plan of action.

20. I make jokes about it.

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- | | |
|---|--------------------------|
| 21. I accept that this has happened and that it can't be changed. | <input type="checkbox"/> |
| 22. I hold off doing anything about it until the situation permits. | <input type="checkbox"/> |
| 23. I try to get emotional support from friends and relatives. | <input type="checkbox"/> |
| 24. I just give up trying to reach my goal. | <input type="checkbox"/> |
| 25. I take additional action to try to get rid of the problem. | <input type="checkbox"/> |
| 26. I try to lose myself for a while by drinking alcohol or taking drugs. | <input type="checkbox"/> |
| 27. I refuse to believe that it has happened. | <input type="checkbox"/> |
| 28. I let my feelings out. | <input type="checkbox"/> |
| 29. I try to see it in a different light, to make it seem more positive. | <input type="checkbox"/> |
| 30. I talk to someone who could do something concrete about the problem. | <input type="checkbox"/> |
| | |
| 31. I sleep more than usual. | <input type="checkbox"/> |
| 32. I try to come up with a strategy about what to do. | <input type="checkbox"/> |
| 33. I focus on dealing with this problem and, if necessary, let other things slide a little. | <input type="checkbox"/> |
| 34. I get sympathy and understanding from someone. | <input type="checkbox"/> |
| 35. I drink alcohol or take drugs, in order to think about it less. | <input type="checkbox"/> |
| 36. I kid around about it. | <input type="checkbox"/> |
| 37. I give up the attempt to get what I want. | <input type="checkbox"/> |
| 38. I look for something good in what is happening. | <input type="checkbox"/> |
| 39. I think about how I might best handle the problem. | <input type="checkbox"/> |
| 40. I pretend that it hasn't really happened. | <input type="checkbox"/> |
| | |
| 41. I make sure not to make matters worse by acting too soon. | <input type="checkbox"/> |
| 42. I try hard to prevent other things from interfering with my efforts at dealing with this. | <input type="checkbox"/> |
| 43. I go to the cinema or watch television, to think about it less. | <input type="checkbox"/> |
| 44. I accept the reality of the fact that it happened. | <input type="checkbox"/> |
| 45. I ask people who have had similar experiences what they did. | <input type="checkbox"/> |
| 46. I feel a lot of emotional distress and I find myself expressing those feelings a lot. | <input type="checkbox"/> |
| 47. I take direct action to get around the problem. | <input type="checkbox"/> |
| 48. I try to find comfort in my religion. | <input type="checkbox"/> |
| 49. I force myself to wait for the right time to do something. | <input type="checkbox"/> |
| 50. I make fun of the situation. | <input type="checkbox"/> |
| | |
| 51. I reduce the amount of effort I'm putting into solving the problem. | <input type="checkbox"/> |
| 52. I talk to someone about how I feel. | <input type="checkbox"/> |
| 53. I use alcohol or drugs to help me get through it. | <input type="checkbox"/> |
| 54. I learn to live with it. | <input type="checkbox"/> |
| 55. I put aside other activities in order to concentrate on this. | <input type="checkbox"/> |
| 56. I think hard about what steps to take. | <input type="checkbox"/> |
| 57. I act as though it hasn't even happened. | <input type="checkbox"/> |
| 58. I do what has to be done, one step at a time. | <input type="checkbox"/> |
| 59. I learn something from the experience. | <input type="checkbox"/> |
| 60. I pray more than usual. | <input type="checkbox"/> |

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Appendix 4 - Education Booklet

OSTEOPOROSIS

A Guide For Sufferers

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WHAT IS OSTEOPOROSIS?

This booklet was prepared by Charlotte Davenport Clarke* (Doctoral Trainee in Clinical Psychology) for research purposes only, and must not be copied or used for any other purpose.

Osteoporosis (porous bones) causes bones to become so fragile and brittle that they break very easily. This is why it is often referred to as 'brittle bone disease'. People of all ages can develop Osteoporosis, but it tends to be more common in the over 50s. In the UK, 1 in 3 women and 1 in 12 men suffer broken bones as a result of Osteoporosis. The disease may go unnoticed in the early stages; fractures of the wrist, hip, or spine can often be the first indication that bones have become fragile because of Osteoporosis. Loss of height can be a further sign that Osteoporosis has developed. A bone density measurement is the only way to tell how much bone mass has been lost. An xray will only be able to give an indication of whether Osteoporosis is present, and will only be capable of doing this once considerable loss of bone density has taken place. By this time, a fracture has very often already happened. Until about ten years ago, Osteoporosis was considered to be an unavoidable consequence of growing older. It is now known that this

*Some of the facts and figures contained in this booklet were provided or verified by the National Osteoporosis Society.

is not the case, since people of all ages can develop the disease, including children. Osteoporosis can very often be avoided altogether, or treated once it has developed. Some new treatments that are now available can prevent bone loss from getting any worse, therefore reducing fracture risk.

WHAT CAN CAUSE OSTEOPOROSIS?

There are a number of factors that can contribute to the development of Osteoporosis. This means that the cause or causes may be different for each person. A diet rich in calcium is essential to develop and maintain strong bones. Other nutrients such as vitamin D, Magnesium, and Zinc are also important to make sure that calcium can be properly absorbed. Regular, weight-bearing exercise is another important factor that helps to build bone.

Osteoporosis in women can be caused by a drop in hormone levels that occurs with the menopause. In men, lack of the male hormone testosterone can be the cause.

USEFUL ADDRESSES

National Osteoporosis Society (NOS)

PO Box 10

Radstock

Bath

BA3 3YB

Telephone: 01761 471771

Helpline: 01761 472721

The Institute of Complimentary Medicine

PO Box 194

London

SE16 1QZ

Backfriend ME Design Ltd

Clock Tower Works

Railway Street

Southport

PR8 5BB

Depression is **not** a sign of weakness. It can be an indication that the sufferer needs more help and support than they are getting. Depression is more than just the transient feelings of sadness that everyone experiences from time to time. It is an illness that can severely affect quality of life, and it therefore needs to be taken very seriously. So if you feel that you are suffering from depression, do not hesitate to seek professional help.

Risk Factors

In Women

Early menopause (before 45)

Hysterectomy

Prolonged loss of periods

In both men and women

Over-dieting and weight loss

Over-exercising

Corticosteroid Treatment

Long History of Steroids (e.g. for Asthma, Rheumatoid Arthritis etc).

Low Calcium intake

Immobility (too little exercise)

Smoking

Excessive alcohol consumption

Parents or close relatives with Osteoporosis

Drinking more than 6 cups of coffee a day

Hyperthyroidism

Intestinal disease

HOW CAN OSTEOPOROSIS BE PREVENTED, OR SLOWED DOWN ONCE IT HAS DEVELOPED?

Exercise

Regular weight-bearing exercise is important to build bone strength. Walking fairly briskly for 20 minutes at least 3 times a week is recommended for those who are able to do so. Walking in the sunlight has the added benefit of helping the body to produce vitamin D, which is needed to absorb calcium. People who suffer a lot of pain when walking, may find that gentle exercise in a warm swimming pool can be a good second choice.

Diet

A good, balanced diet is essential for developing healthy bones and maintaining bone strength throughout life. Calcium has an important role to play in building and keeping bone mass. Although experts do not agree on the amount of calcium needed on a daily basis, a general guide for people over 45 years of age is 1500mg a day. It is important to get the balance right, since too much

perception of control or mastery, and optimism about the future, may all be challenged as a result of developing Osteoporosis. Since these factors are important in maintaining psychological well-being, Osteoporosis may give rise to a depressive reaction related to the changes and restrictions it places on the sufferer.

If you feel that you are suffering from depression, you should talk it over with your GP who may wish to refer you to a Clinical Psychologist. Depression often makes people feel like giving up because the future begins to look hopeless to them. A major factor in keeping depression going is the way you think about it. Sometimes negative thoughts can become so automatic that you can be completely unaware of them. Automatic thoughts are often irrational and mistaken but seem believable to you at the time. You can learn to challenge them and to develop thoughts that are more positive, realistic and reassuring. A Clinical Psychologist may be able to help you if you feel that you need to develop a more positive approach.

SOCIAL SUPPORT

The National Osteoporosis Society runs support groups in most areas. These groups give people an opportunity to meet and talk with others who are in a similar situation. Such groups can be helpful in that they provide a sense of belonging, and make people feel less isolated. Exchanging tips with others can also be helpful. If you join the NOS you will automatically be put in touch with your local group. It is important, in addition, to socialise with people who do not suffer from Osteoporosis in order to provide a balance and a different perspective.

A WORD ABOUT DEPRESSION

There can be a number of causes for depression. If a person is physically ill and depressed, their depression could be a reaction to the distressing situation in which they find themselves. A chronic illness such as Osteoporosis may force the sufferer to re-evaluate long-term expectations and life plans. Positive self-evaluation,

calcium in the diet can cause problems. The best way to get a good calcium intake is by eating enough calcium-rich foods. However, in some cases a calcium supplement may be recommended if the diet is particularly poor for some reason. If you feel that you may be deficient in calcium, it might be a good idea to talk to your Doctor who should give you further guidance on supplementing your diet with adequate calcium.

Some examples of calcium rich foods

4 oz Cottage cheese	82mg
1oz Cheddar cheese	107mg
1 glass milk (skimmed is best)	360mg
1 slice of bread	30mg
2oz sardines	220mg
4oz spring cabbage	34mg
4oz broccoli	85mg
4oz baked beans	50mg
2oz peanuts	24mg
2oz dried apricots	52mg
1 large orange	58mg

*note - Skimmed milk contains more calcium than full fat milk but less calories and less fat.

In addition to calcium in the diet, bones also need a good supply of other nutrients. For example, vitamin D is of particular importance in helping bones to absorb calcium. Recent research in France has shown that vitamin D can help reduce the number of Osteoporotic fractures of the hip in elderly women. A good source of vitamin D is sunlight, but it is also present in milk (fortified skimmed milk being a good choice), and oily fish. Other essential nutrients include magnesium, and zinc, both of which are in short supply in Western diets. Since it is important not to take too much of any vitamin or mineral, it may be worth talking to your Doctor before deciding on whether you need to take a supplement. Further advice on diet can be obtained by contacting the National Osteoporosis Society whose address and telephone number are printed at the back of this booklet.

6. Bra extensions, which can be bought at sewing shops and haberdashery stores, can help to take the pressure off the thoracic area of the spine.

Make-up

Continuing to make an effort with your appearance can boost confidence and self-esteem. If you enjoy wearing make-up, there is no reason why you should not continue to do so. If pain is experienced when attempting to apply make-up, try sitting on the bed with pillows around you for padding. Do not push yourself to complete a task in one go, take it in easy stages. Immediately you start to feel pain, stop and use a heat pad or ice pack to bring it under control before continuing. This may feel frustrating, since the task will take a bit longer to complete, but try not to give up.

Eating

If vertebral fractures have occurred you may find that you sometimes have digestive problems as a result of the stomach having less space. If this is the case, try eating small, regular amounts of food to avoid feeling over full.

may start to curve. This means that there will be less room in the abdomen for the internal organs (such as stomach and liver) and the tummy may therefore stick out.

If you have experienced a loss of height and changes in posture, you may have difficulty finding clothes to fit. It may also take time to come to terms with the way your body now looks since developing Osteoporosis. Not everyone suffers such severe changes, but for those who do, here are a few hints that may help.

Fashion For Ladies

1. Dropped waist dresses can camouflage a distended tummy.
2. Swing-back jackets cut on a circle can help to camouflage a curved spine.
3. A small (not too high) heel can appear more elegant.
4. A scarf draped round the shoulders can detract from a curved spine.
5. Trousers with a slim leg and elasticated waist can be both elegant and comfortable.

Treatments

Treatments for Men

Research into treatments for Osteoporosis in men is still in its infancy, due to a previous belief that men are rarely affected. It is now known that as many as 1 in 8 men have Osteoporosis, and this is resulting in more research into how the disease can be treated in men.

Testosterone replacement therapy is sometimes recommended for men whose testosterone levels are found to be low. A simple test in the Doctors surgery will establish whether levels of this male sex hormone are too low. Testosterone replacement therapy must be carefully monitored, and only taken on the recommendation of a specialist.

Other treatments for Osteoporosis in men are being investigated. These include:-

1. Calcitonin - a hormone made by the thyroid gland. It prevents the cells that break down bone (osteoclasts) from working too quickly, allowing the cells which rebuild bone (osteoblasts) to be more effective. A

number of trials have found that calcitonin halts bone loss in women, therefore leading to stronger bones that are less likely to fracture. It is hoped that it will have the same effect in men.

2. Vitamin D and Calcium Supplements - as discussed above.

3. Etidronate - a non-hormonal treatment which works by attaching to the bone surface and making the cells which break down the bone (osteoclasts) less active, therefore allowing the osteoblasts to rebuild unhindered. Didronel PMO is a form of etidronate that can be prescribed for men if a specialist considers it to be appropriate in preventing further bone loss.

Other treatments for Osteoporosis in men are likely to become available as research progresses. The National Osteoporosis Society, whose address and telephone number appear at the back of this booklet, will be able to provide further up-to-date information.

Osteoporosis can also result in the sufferer feeling quite anxious about what the future holds in relation to the progression of the disorder. Research into how the progression of Osteoporosis can be halted is being undertaken all the time. There are already some effective treatments on the market that are capable of halting bone loss and reducing fracture risk. None of us knows what the future holds, so there is probably little point in worrying about it. Try instead to inject as much enjoyment into the present as you possibly can. Avoid anticipating something unpleasant that may never happen. Decide to deal with future problems as they arise rather than allowing the threat of them to spoil the quality of your life now.

CHANGES IN APPEARANCE

Loss of height and changes in posture can be a particularly distressing feature of Osteoporosis, and may affect body image and self-esteem. If several vertebrae have become crushed, the spine becomes shorter and

becoming so frightened of leaving the home, that their quality of life is, in fact, even more limited than it might be if they did have a fracture. Some sensible precautions for minimising the risk of fracture include:-

1. Use a walking stick when out walking. This can help to steady you and reduce the risk of stumbling.
2. Avoid crowded situations where there may be a risk of being jostled.
3. When travelling in a car, place plenty of pillows or cushions around your sides in order to avoid being thrown from side to side. Inflatable cushions are a good idea for coach or train travel, since they are light and easily transportable.
4. Avoid twisting or moving awkwardly. do not stretch up to reach something from a high shelf - ask someone else to pass it to you. Do not stoop to pick something up off the floor - consider investing in a 'helping hand' (a device resembling a false hand on a long stick), designed to help people who have difficulty bending and stretching.

Treatments for Women

1. Hormone replacement therapy for women has been found to be effective in preventing bone loss. Hormone replacement close to the time of menopause has demonstrated greater benefit than if given later on, once Osteoporosis has developed. However, the evidence now suggests that women in a much older age group can benefit from hormone replacement. Oestrogen (a female hormone) prevents the cells that destroy old bone from working too fast, therefore giving the bone-building cells (osteoblasts) a chance to create new bone.

Researchers are continuing to investigate the role of another hormone, progesterone, in helping the bone-building cells (osteoblasts) to do their job more efficiently. Women who take hormone replacement therapy through their GP must be given blood pressure and breast examinations on a regular basis.

2. Etidronate - This non-hormonal treatment is a bisphosphonate which works by attaching to the bone surface and slowing down the work of cells that break

down bone (osteoclasts). This allows the bone-building cells (osteoblasts) to create new bone. Other, more powerful bisphosphonates are becoming more available following research into their effectiveness. Your specialist is in the best position to discuss with you the most appropriate treatment in your case.

3. Calcitonin - (As explained above under treatments for men)
4. Vitamin D and Calcium Supplements - as discussed above.

In general, both men and women with Osteoporosis may be able to minimise its effects by:-

1. Ensuring that the diet is well-balanced, and rich in calcium.
2. Avoiding smoking.
3. Avoiding excessive alcohol intake
4. Taking regular, weight-bearing exercise.

Osteoporosis is not a fair disease. You may have done all the right things all your life and still developed it. You

3. Try breaking tasks down into smaller, more manageable steps. For example, instead of standing and ironing several items in one go, iron only what is needed for the next day. Take regular breaks to rest and bring the pain under control, rather than pushing yourself until the pain is intolerable.

4. There is no shame attached to asking for help from those who are willing to give it. It is not your fault that you are no longer in a position to do all the things you were previously capable of, so avoid feeling any sense of guilt.

FEAR/ANXIETY

The diagnosis of Osteoporosis can carry with it a great deal of fear and anxiety. For example, fear of fracture or further fracture may result in the sufferer feeling fearful of situations and activities that may be risky. Whilst it is sensible to take certain precautions in order to avoid future fracture, it is also important not to let fear limit your life unnecessarily. Some sufferers find themselves

1. Substitute a more realistic and enjoyable activity for one that is no longer sensible in the light of the possible risks involved. Try to think about what you **can** now do, rather than focusing on what is no longer available to you. If you think about it hard enough, there is probably at least one low risk pursuit or interest that you have been meaning to try out for a long time, but never got around to. Pursuing such an interest now may provide you with a renewed sense of purpose, and have the added benefit of distracting your attention away from problems related to Osteoporosis.

2. If the risks of undertaking a certain task outweigh the benefits, (e.g. lifting heavy objects) tell yourself that you have the right to make a rational and sensible decision not to do it because you are aware that it could adversely affect your quality of life. If you need to, explain to those around you what your reasons are for making such a choice, and ask them to respect your decision. Do not be afraid to give such explanations to children, they are often able to understand more than we adults tend to give them credit for.

may also know people who have not taken good care of themselves, but have managed to escape getting Osteoporosis. As medical research progresses, it may become apparent that there are other causes for the disorder which are not yet fully known or understood. For example, some researchers are interested in the possibility of a genetic link which may predispose people to developing Osteoporosis. However, even if this is the case, it should still be possible to minimise its effects by following the advice contained in this booklet.

HOW DO PEOPLE COPE WITH SOME OF THE PROBLEMS ASSOCIATED WITH OSTEOPOROSIS?

Coping With Pain

People who have Osteoporosis can suffer varying degrees of pain. Acute pain is often experienced immediately after breaking a bone, whereas chronic pain can result from the changes in posture and loss of height that result from vertebral fractures. Some sufferers experience very little pain, whereas others experience high levels of pain

on a daily basis. Pain is a subjective experience, and will therefore be different for each individual. Some methods of controlling pain may work well for one person and not for another. It is therefore important to find the most effective methods for you. Here are some ways of coping with pain.

Pain Killers

There is no shame in taking painkilling drugs to control pain. It is, however, important to find the painkiller that works best for you without causing you any side effects. The strength and dosage needed will depend largely upon the intensity of the pain you are suffering at any given time. Mild, background pain may respond to paracetamol which can be bought over the counter at a chemist shop, whereas more severe pain will need more powerful medication. Talk to your GP about what s/he can recommend.

Anti-inflammatory Pain Killers

Drugs such as Ibuprofen and Naproxen can help to control both pain and inflammation. Most people tolerate

considerable increase in pain. Simple things that most people take for granted, such as putting out the rubbish, lifting a child, opening a jar of jam, or stretching up to reach something from a shelf, may become a risky ordeal for the Osteoporosis sufferer. Many people feel a deep sense of loss in this regard, and may suffer a grief reaction for the previously active and capable person they once were. An added problem is that, because pain is something no-one else can see, others may not fully understand why the sufferers activities have become so limited. The sufferer themselves may continue to push themselves to complete tasks, either out of feelings of guilt (around not contributing as much as they always have), or perhaps out of a kind of denial that anything has really changed. Denial can sometimes result in even more distress if the sufferer finds they cannot reach their desired goal. Most people find a way to cope eventually with these and other problems through a process of trial and error. Here are a few ideas that may help.

3. Imagine you have a switch (rather like the volume switch on a radio), that can allow you to turn down the intensity of the pain until it is manageable.

Alteration

1. Try altering the meaning of the pain by imagining that it is being experienced during an important life event such as a sports competition, or the caring of children.

2. Reinterpret your perception of the pain by imagining it as some other sensation, such as numbness, tingling, or itch.

3. Separate yourself from the pain as if it is not happening to you (e.g imagine floating above it).

All these strategies will take practice before you become really proficient at them, so do not be put off if they do not have the desired effect immediately you start to use them.

LOSS

The losses that people suffer as a result of developing Osteoporosis can be difficult to come to terms with. For example, tasks such as hoovering, ironing, and gardening may no longer be undertaken without the risk of a

them well, but a few people have found that they can cause indigestion.

TENS

TENS (Transcutaneous Electrical Nerve Stimulation) machines have been found to be helpful in relieving pain for some people. This is a small machine that hooks at your waist on to a belt. The electrodes placed at the points of pain emit tiny tingling pulses, which work by blocking the pain messages from the brain. A TENS machine is available on loan from the National Osteoporosis Society (see the back of this booklet for address), or from physiotherapy departments.

Heat/Cold

A heat pad placed on the painful area for 15-20 minutes can help to alleviate pain. Heat pads are available from most leading chemists.

Ice packs can also be very effective, particularly for acute pain immediately following fracture. Ice has the advantage of also reducing inflammation.

Acupuncture

Acupuncture relieves pain through its effects on nerve impulses and pain pathways. More information regarding qualified practitioners in your area can be obtained from the Institute of Complementary Medicine (see the back of this booklet for the address).

Physiotherapy

Physiotherapy can be helpful immediately following fracture, when it is important to regain mobility. A qualified physiotherapist will be able to give you advice about gentle exercises to strengthen muscles. Do make certain that the physiotherapist is fully aware that you are suffering from Osteoporosis before they begin to treat you.

Hydrotherapy

Hydrotherapy can help to ease aching joints and relax tense muscles. Some Local Authorities provide courses of hydrotherapy and lessons in gentle exercise to keep muscles strong. Hydrotherapy pools are normally heated to 98 degrees Fahrenheit.

trees. Stay as long as you feel you want to, and come back feeling calm but refreshed.

Pain Coping Strategies

Distraction

1. Try some simple mental arithmetic, such as counting backwards from 100 and making yourself go back to the beginning every time you lose your place.
2. Engage in a pleasurable fantasy of your choice.
3. Try a time distortion technique (e.g. making the duration of the pain seem to be shorter than it actually is).
4. Imagine yourself to be back at a pleasant time prior to the pain experience.

Alleviation

1. Focus your mind on the pain and try to decide what colour it is. If it is experienced as a burning pain, you may see its colour as red. Try cooling it down by changing it to the colour blue, or to a colour of your choice.

suggested here that Osteoporosis sufferers should push themselves through pain by focusing single-mindedly on the task in hand. Since such a course of action could lead to greater injury and pain, it is clearly better to be more realistic about what can be achieved in the light of having developed Osteoporosis. What is being suggested here is that you can learn some effective coping strategies that will help you to manage better on a day to day basis. Here are some strategies that you may choose to try.

Imagery

1. Get into a comfortable position, either sitting or lying. Now imagine yourself somewhere where you can feel really good. We are all capable of daydreaming and having the experience of being in two places at once. Allow yourself to enter that experience as if you are really there (e.g. on the beach, in the garden). See the sights, hear the sounds, and feel all the sensations. The warmth of the sun on your skin; the gentle breeze against your face, the sound of the sea, or the birds singing in the

Swimming

Swimming can be a beneficial distraction, so if you can swim try to keep it up. Local Authorities often have special rates for disabled people, and will usually heat the pool to a higher temperature. If you cannot swim, just playing around in the water can help to ease aching joints and relax tense muscles.

Sitting

If sitting increases pain, experiment with different chairs until you find the one that is the most comfortable for you. Here are a few tips that may help.

1. Place a thick foam cushion under the chair cushion to avoid back strain when getting in and out of the chair.
2. Invest in a 'Backfriend', which is a seat specially designed to help back sufferers sit more comfortably (see the back of this booklet for address)
3. Alternate sitting and standing jobs so that you are not sitting in one position for too long.
4. Place pillows at your back and sides, but do not twist to adjust them - ask someone else for assistance.

Beds and Sleeping

If your bed is too firm it may make a tender spine more painful. If it is too soft, it will not provide the right support. Strike a happy medium by placing a board under the mattress to provide proper support, and a duvet on top of the mattress to lie on for softness.

Sexual Activity

Many people who suffer from Osteoporosis find that the pain and disability often associated with the disorder can spoil their sexual enjoyment. If this sounds familiar to you, talk things over with your partner, and discuss ways in which some of the difficulties can be overcome. Try experimenting together with different positions until you find the most comfortable ones to suit you both. You may find it helpful to pack pillows around you for extra comfort when making love. Remember that there are many satisfying ways to enjoy love-making without sexual intercourse necessarily having to take place. If your sex life is important to you, there is no reason why Osteoporosis should be allowed to deprive you of it. With an understanding and patient partner, together with

a little imagination, it should be possible to overcome many of the difficulties and enjoy a satisfying sex life for as many years as you wish.

Relaxation Techniques

A tense mind can result in a tense body, which in turn may increase physical symptoms such as pain. It therefore makes sense that learning relaxation techniques can help people with Osteoporosis to gain more control of their painful symptoms. There are a number of techniques available that can aid relaxation. Simple ones include, listening to soothing music, and/or imagining you are in a peaceful place out in nature. Imagery can also have the added benefit of providing a welcome distraction from pain or discomfort.

Do not underestimate the power of the mind. It has an amazing ability to switch pain off, particularly if it is attending to a more pressing problem. One example of this process is the Manchester goal keeper who was unaware that he had broken his neck because he was so involved in the match. It is, however, certainly not being

Appendix 5.

Relaxation Instructions

This relaxation tape has been specially personalised for your individual use taking into consideration your stated needs and preferences. Your relaxation tape should be played at least once a day, and at any other time of the day or night when you feel the need to relax or to bring your pain under control.

Before beginning your relaxation session, find yourself in a warm, quiet place where you are unlikely to be disturbed. Loosen any tight clothing, and get yourself in a comfortable position either sitting or lying. Make sure your feet are uncrossed and placed firmly on the floor. Unclasp your hands and place them at your sides. If you feel the need to move your position during the session, do so. It is important that you feel as comfortable as possible throughout.

Listen carefully to the tape, and practise the suggestions made on it. The more you play the tape, the more you will be capable of relaxing, and of bringing your pain under control. After several playings, you may find that you can remember the techniques so that you can use them yourself at times when it is not possible or convenient to play the tape. Remember, practise makes perfect, so persevere, and do not be put off if you do not achieve immediate results.

When each relaxation session has ended, give yourself a few minutes to become properly alert before standing up. After a number of playings you may find that you

fall asleep during the recording. This is perfectly fine, and is an indication that you have learned how to fully relax.



CORNWALL ETHICS COMMITTEE

☎01872 252941

Our Ref: 7.5.96

Business Unit

5 Penventinnie Lane

RCH (Treliske)

Truro

8 July 1996

Private & Confidential

Mrs. C. A. Davenport Clarke

Trainee Clinical Psychologist

121 Phemyssick Road

Boscoppa

St Austell PL25 3EU

Dear Mrs. Davenport Clarke

Re: A comparison of the relative impact of stress management and education on coping with Osteoporosis (7.5.96)

I write to confirm that Dr. James' action in awarding Chairman's Approval to the above study going ahead was endorsed by members of the Ethics Committee at its meeting on the 4 July 1996.

Yours sincerely

MRS. CARMEN D. THOMAS

Coordinator

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