

S u m m a r y

- Medical advances have led to a considerable rise in the level of elective surgery undertaken as day-case surgery and with minimal hospital stay. However, amid such advances, pre-operative psychological care has remained relatively static.
- A considerable number of patients are very anxious prior to elective surgery and little formal care is undertaken to address this major issue. A review of the literature from 1990 to 2002 was therefore undertaken in order to assess the present level of knowledge and interventions concerning patient anxiety when undergoing modern, intermediate surgical intervention.
- Thirty-four studies embracing data from 3,754 patients undergoing both in-patient and day-case procedures were reviewed. Three main themes emerged - causes of anxiety, clinical concerns and measurement, and anxiety management.
- Each theme is discussed alongside details extracted from the relevant studies. Finally, the main issues arising are summarised and future research challenges identified.

Keywords - anxiety, elective surgery and pre-operative psychological intervention.

I n t r o d u c t i o n

The Department of Health (2000) has a clear vision for the future level of day surgery activity. The NHS states "Around three-quarters of operations will be carried out on a day case basis with no overnight stay required" (p. 19). In 1985 less than 15% of all elective surgery was undertaken on a day-case basis (NHS Management Executive Value for Money Unit 1991). Such a rapid change in surgical healthcare delivery over the past 20 years has ensured a major shift in medical and nursing surgical intervention. Patients increasingly spend considerably less time in hospital i.e. average length of stay in a day surgery facility within Europe is currently 6½ hours (Pfisterer *et al* 2001). Intermediate elective surgical episodes once requiring lengthy hospital admission are therefore fast disappearing, never to return as in-patient surgery.

Intermediate, modern elective surgery is defined here as the planned uncomplicated surgery requiring either day surgery or minimal hospital stay. Additionally, in-patient surgical stay is becoming extremely brief. In a recent study by Tierney (1999), 2.7 days was the mean length of stay.

Such a shift in medical and nursing intervention has had, and is increasingly having, a major impact on the delivery of the psycho-educational elements of care (psycho-educational intervention is defined here as the purposeful attempt to provide tangible aspects of care aimed at enhancing an individual's psychological status together with the planned provision of educational material). Inherent time restrictions habitually ensure medical aspects of care take preference over the psycho-educational aspects (Fung & Cohen 2001). Direct patient contact time is falling and progressively leading to a greater degree of pre and post-operative patient self-care (Hazelgrove & Robins 2002). In such a modern surgical healthcare environment, where patient self-care is a growing implicit component, effective psycho-educational intervention will, by necessity, become inextricably linked with the future of successful modern elective surgery.

It has been established for over four decades that many patients are very fearful of their anaesthetic, the operation, pain and unconsciousness (Egbert *et al*, 1964; Ramsay, 1972; Male, 1981; McCleane & Cooper, 1990; Mitchell 1997; 2000a). Such fears, although identified, have not been formally acted upon within the clinical environment. If the causes of such concerns can be firmly established, supportive interventions could be developed. A literature review was therefore undertaken to examine the present level of knowledge concerning patient anxiety when undergoing modern, intermediate elective surgery. Only research papers from 1990 to 2002 were considered. Anxiety management strategies extracted from studies from 15 years ago and employing in-patients undergoing a variety of intermediate and major surgery are no longer appropriate in the modern elective, surgical arena. The review, therefore, only encompassed adults (over 18 years) undergoing non-life threatening, intermediate surgical procedures with no chronic ill-health conditions. Ophthalmic, dental and major surgical

procedures were omitted together with medical investigations as all were considered to be open to additional aspects of anxiety i.e. disruption of vision, dental phobia and possible medical pathology. The keywords anxiety, stress, surgery, anaesthesia and fear were entered into a MEDLINE, CINAHL, Cochrane Library, PsychInfo and Scirus.com. Cross-reference and hand searches were also undertaken until no further material was uncovered.

Utilising the above criteria, 34 research studies were discovered which specifically investigated surgical anxiety in the modern arena. The studies embraced data from 3,754 patients undergoing a variety of intermediate surgical procedures in both in-patient and day-case facilities. Eighteen studies employed in-patients as participants although, in three of these studies, the patients were admitted on the same day as surgery. Fourteen studies employed day-case patients as participants and the remaining two employed a mixture. The majority of studies (n=22) was undertaken by medical staff, eight by nursing staff and four by social scientists (Table 1). The preferred method of investigation was by experimental research design and survey (Table 2). The largest number of studies were undertaken in Europe (Figure 1). Spielberger's et al (1983) State-Trait Anxiety Inventory (STAI) was the most common form of data collection, very closely followed by researcher designed Visual Analogue Scales (VAS). Three main themes emerged from the review i.e. causes of anxiety, clinical concerns and measurement, and finally anxiety management.

Causes of Anxiety

The causes of pre-operative anxiety were investigated in two main areas i.e. common anxiety provoking events and specific anxiety provoking events. Each aspect will be examined in greater detail and the results summarised.

Common Anxiety Provoking Events

Four studies examined common distressing pre-operative events. Voulgari *et al*, (1994) surveyed 162 in-patients in order to determine the causes of anxiety. Ten percent of patients were anxious for several days post-operatively and 16% were also depressed during the post-operative period. Personality (anxious pre-disposition) was put forward as the most likely cause for such a response. In a similar survey by Zvara *et al*, (1994) 200 day surgery patients were asked to note their main concerns regarding anaesthesia. Of most concern was the method of induction and the anaesthetic drugs to be used. The second concern involved possible side effects followed by the length of time to recover. It is suggested that such details could therefore form the basis of the information provided by the anaesthetist on the day of surgery.

Badner *et al*, (1990) established a link between anxiety 12 hours prior to surgery and anxiety on the day of surgery. Identifying the highly anxious patient was therefore deemed very important so that supplementary intervention could be offered. Anxiety was also higher in female patients and novice patients. Additionally, anaesthetists were deemed to be poor predictors of anxiety within the time frame available. In a similar study, Beddows (1997) examined 40 in-patients to determine anxiety on admission and immediately prior to surgery. Two weeks prior to admission patients were randomly assigned into two groups i) home visit by the ward nurse to provide information/ administer anxiety questionnaire and, ii) no visit, merely a letter containing general hospital information and the questionnaire for completion. Although both groups experienced an increase in anxiety on the day of surgery, the control group was significantly more anxious. However, the study lacked an attention-control group and an improvement in anxiety could quite reasonably have been observed because of the extra attention provided to the experimental group i.e. being treated differently (Neale & Liebert 1986). Finally, Birch *et al*, (1993) studied 60 day-case patients to assess anxiety levels. The Hospital Anxiety and Depression questionnaire (HAD) (Zigmond & Snaith 1983) was administered together with a VAS in the post-operative period to assess anxiety. Female

patients and novice patients were determined to experience greater anxiety although not at a significant level.

Specific Anxiety Provoking Events

Three studies examined specific aspects of pre-operative anxiety. In order to determine what events patients found most distressing regarding surgery (with particular reference to denture removal), Cobley *et al*, (1991) studied 124 in-patients undergoing general anaesthesia. The five most distressing events were waiting to be collected for theatre, not being allowed to drink, not being allowed to wear dentures, going inside theatre and being taken on a trolley to theatre. Women were significantly more distressed than men at having to remove their dentures. It was therefore recommended that dentures could be worn to the operating theatre. Jelacic & Bonke (1991) surveyed 40 in-patients in an effort to determine any difference in anxiety between voluntary and non-voluntary surgery i.e. breast reduction (voluntary) and general surgery (non-voluntary). Utilising only the STAI, a significant difference was established between the two groups i.e. breast reduction patients were less anxious. However, the survey states that it is most unlikely that this was the sole reason as only anxiety was measured and not the specific causes.

Finally, in a survey by Calvin & Lane (1999), a slightly different approach to the study of pre-operative anxiety was examined although its rationale is not clearly determined i.e. anxiety and its association with the adult stages of development. A STAI and Mishel Uncertainty in Illness Scale (MUIS) (Mishel, 1981) were employed as subjective measures. Moderate levels of uncertainty and anxiety were recognised in all patients although no difference between the adult stages of development were established. Increased communication and programmes of psycho-educational management were recommended.

In summary, a number of common and specific causes of pre-operative anxiety have been highlighted. Most studies found patients to be anxious in the pre-operative period. Given the range of causes, it appears unreasonable to expect anxiety to only begin once the patient enters hospital. Badner *et al*, (1990) suggested that some patients are anxious at least 12 hours

prior to surgery. Anxiety may, therefore, commence prior to admission although may rise to a peak at certain points i.e. when being collected for theatre, when not being allowed to drink and when having to remove dentures (especially for women). Females and novice patients were observed on a number of occasions to be more anxious although this frequently did not reach a significant level. Increased anxiety was associated with reduced pre-operative information provision and non-voluntary surgery. Finally, the method of induction of anaesthesia was a very anxiety provoking aspect for many patients i.e. possible use of an anaesthetic mask over the face.

Clinical Concerns and Measurement

The issues arising within this section are associated with anaesthetic concerns and indices of anxiety. Each aspect will be examined in greater detail and the results summarised.

Anaesthetic Concerns

Five studies examined aspects of anaesthesia associated with anxiety. Daoud & Hasan (1999) observed 94 day-case patients to evaluate the effects of anxiety on induction of anaesthesia. Higher anxiety was associated with increased time for the jaw to relax, a higher incidence of coughing and thereby more anaesthetic interventions during insertion of laryngeal airway. In a similar study by Maranets & Kain (1999), 57 in-patients undergoing general anaesthesia were surveyed. Utilising STAI, the Monitor-Blunter Style Scale (MBSS) (Miller, 1987) (gauges level of information required) and monitoring depth of anaesthesia, an increase in trait anxiety was associated with increased intra-operative anaesthetic requirement i.e. patients with a pre-disposition to anxiety required increased anaesthesia. In an experimental design by Lydon *et al*, (1998), 21 in-patients were studied to examine the association between anxiety and gastric emptying. Patients fasted for 8 hours and then a Paracetamol solution was ingested. Intravenous blood was taken at certain intervals over a 90-minute period to gauge absorption rate. It was concluded that gastric emptying was not adversely delayed by anxiety i.e. highly anxious patients did not experience slower emptying of the stomach. However, it is stressed that as a liquid preparation was utilised, the conclusions could only relate to liquids.

Hahm *et al*, (2001) studied 44 in-patients to determine whether Clonidine (pre-medication) could minimize increases in plasma epinephrine due to anxiety and thereby prevent a decrease in serum potassium (hypokalaemia can lead to life-threatening arrhythmias during general anaesthesia). Patients were randomly assigned into two groups i) Clonidine 300 µg two hours prior to induction and, ii) same only placebo. The Clonidine group had higher potassium levels immediately prior to induction and these levels were higher than the control group although not significantly. Clonidine was therefore recommended to avoid potential hypokalaemia. McCleane & Watters (1990) surveyed 200 in-patients also to determine the relationship between anxiety and serum potassium. Blood was taken 12 hours prior to surgery and again immediately prior to anaesthesia. Only modest non-significant changes were established between serum potassium and anxiety. However, 60% of patients who received an anxiolytic pre-medication (Tamazepam 10 - 30 mg) and a visit from the anaesthetist 12 hours prior to surgery, were significantly less anxious immediately prior to surgery in comparison to the previous day.

Indices of Anxiety

The measurement of pre-operative anxiety in modern, elective surgery is becoming very difficult to administer, mainly due to the imposed time restrictions (Mitchell, 2003). Several reviews of the literature in previous decades have reported a plethora of studies employing clinical measures to gauge psychological recovery i.e. length of hospital stay, analgesics consumed and level of post-operative mobility (Wilson, 1981; Mathews & Ridgeway, 1984; Miller *et al*, 1989; Rothrock, 1989; Suls & Wan, 1989; Johnston & Vogeles, 1993). Obviously, in modern elective surgery, such indices of recovery are now becoming obsolete and other measures are required. As a result Storm *et al*, (2002) monitored 11 in-patients intra-operatively to evaluate skin conductance and anxiety i.e. increased sympathetic nerve activity detectable in the skin. Palmar electrodes and depth of anaesthesia were monitored at specific intra-operative intervals. Positive correlations were established between the number and amplitude of skin conductance and depth of anaesthesia. In contrast, however, Boeke *et al*, (1992) examined the length of hospital stay in an attempt to measure pre-operative anxiety. Eighty-one in-patients were

surveyed using a combination of STAI and VAS. It was reported pre-operative anxiety was not related to the length of hospital stay although changes in medical practices and lack of sensitivity of the measures employed were stated as possible causes for the lack of findings.

As stated, the vast majority of studies reported here employ subjective measure of anxiety i.e. STAI, VAS or personality questionnaires. Three studies employed both the STAI and VAS (Lepage *et al*, 2001; Murdoch & Kenny, 1999; Poole, 1993). One study employed the STAI and clinical observations (Markland & Hardy, 1993), one the STAI and the MUIS (Calvin & Lane, 1999), one STAI and Freiburg Personality Inventory (FPI) (Martens-Lobenhoffer *et al*, 2001) and one the STAI and Amsterdam Pre-operative Anxiety and Information Scale (APAIS) (Lydon *et al*, 1998). However, only a weak correlation between measures was achieved by two studies (Lepage *et al*; 2001, Poole, 1993). Such methodological inconsistency has resulted in poor progress concerning the development of effective pre-operative psycho-educational programmes. Seven studies employed physiological indices (McCleane & Watters, 1990; Markland & Hardy, 1993; Augustin & Hains, 1996; Miluk-Kolasa *et al*, 1996; Maranets & Kain, 1999; Storm *et al*, 2002) and ten a mixture of physiological and self-rated measures (Steelman, 1990; Boeke *et al*, 1992; Wikinski *et al* 1994, Winter *et al*, 1994; Mealy *et al*, 1996; Murdoch & Kenny, 1999; Lepage *et al*, 2001; Duggan *et al*, 2002; Hahm *et al*, 2002; Wang *et al*, 2002). Again, only one study reported a correlation between objective and subjective measures i.e. plasma epinephrine and self-reported anxiety (Hahm *et al*, 2002).

In summary, an increase in anxiety was associated with increased anaesthetic requirements and anxiety was related to personality. The absorption of liquid from the stomach was not affected in the highly anxious patient, neither were serum potassium levels. A visit by the anaesthetist was very beneficial and a reduction in anxiety was broadly viewed as more clinically desirable. Additionally, from this literature review and other studies (Mitchell, 2000b; Munafo & Stevenson, 2001), the measurement of pre-operative anxiety is clearly a challenging issue. Future studies concerning patient anxiety and modern surgery may be required to examine the rationale behind the indices employed to gauge anxiety in greater depth. Only a

weak correlation was established between studies which employed a mixture of indices i.e. objective and subjective measures. Within the modern surgical arena new methods of measuring anxiety may be required as numerous behavioural measures are now becoming obsolete. With the inherent time restriction becoming the norm, a more clinically viable approach may be required i.e. brief emotional assessment.

Anxiety Management

The management of pre-operative anxiety was investigated in two main areas i.e. anxiolytic pre-medication and distraction. Each aspect will be examined in greater detail and the results summarised.

Pre-medication

Two main aspects concerning anxiolytic pre-medication have been studied i.e. patient-controlled administration and the drugs employed. Firstly, Smith & Pittaway (2002) undertook a review of the literature (1980 - 1999) specifically concerning pre-medication in day-case surgery. This study was included here because of its implicit relationship with pre-operative anxiety. Pre-medication is not widely employed within day-case surgery for i) fear of delayed discharge (benzodiazepines can have a slow onset and long duration), ii) day-case patients being required to remember important information on discharge and, iii) be able to physically walk out of the day surgery facility. Therefore, a review of clinical practice was deemed appropriate as increased sedation may impact upon such issues. The study identified twenty-nine reports and fourteen studies with data from 1,263 patients. The three main drugs employed were benzodiazepines, beta-adrenoceptor blockers and opioids. No difference in the discharge time between pre-medicated and non pre-medicated patients was established. However, the authors add a note of caution as anaesthetic techniques and day surgery practices have developed enormously over the given search period i.e. 1980 - 1999. Therefore, inferences for current practice should be viewed with care.

Bernard *et al*, (1996) and Murdoch & Kenny (1999) both investigated patient controlled pre-medication. Bernard *et al*, (1996) randomly assigned two groups of patients to receive either a

fixed dose of Midazolam 4 mg or a patient-controlled pump containing Midazolam. No significant difference was established between the groups. For the highly anxious patient, however, anxiety decreased whichever method was employed. Murdoch & Kenny (1999) studied 20 day-case patients all of whom received a patient-controlled pre-medication of Propofol. Although no control group was utilised for comparison, the post-operative satisfaction questionnaire revealed all patients rated their care as excellent (70%) or good (30%). Winwood & Jago (1993) likewise examined the effects of Propofol on anxiety. Twenty-five day-case patients were randomly assigned into two groups i) Propofol induction and, ii) Thiopentone induction. Anxiety fell in most patients in the post-operative period although patients who had received Propofol had significantly lower anxiety scores.

Wikinski *et al*, (1994) and Wittenberg *et al*, (1998) both investigated the effects of Diazepam on pre-operative anxiety. Wikinski *et al*, (1994) randomly assigned 30 patients into two groups i) oral Diazepam 10 mg 2 hours prior to surgery and, ii) same only placebo. Self-rated emotional measures (STAI and VAS) demonstrated no significant difference although mean arterial blood pressure was significantly lower in the Diazepam group. Wittenberg *et al*, (1998) randomly assigned 202 day-case patients into two groups i) oral Diazepam 5 mg 30 minutes prior to surgery and, ii) same only placebo. Both groups demonstrated improvement in anxiety 30 minutes after surgery. However, again, the Diazepam group was significantly less anxious. Unfortunately, as will be highlighted later, a plethora of such studies concerned with the physiologically proven effects of sedation dominate this particular area of research.

Martens-Lobenhoffer *et al*, (2001) and Duggan *et al*, (2002) also examined the use of benzodiazepines. In a survey of 26 in-patients by Marten-Lobenhoffer *et al*, (2001) oral benzodiazepine absorption rate and personality traits were explored. The basis being that patients with a predisposition towards increased anxiety in such a situation may have a faster oral pre-medication absorption rate. However, no significant difference was established. Duggan *et al*, (2002) also investigated Benzodiazepine pre-medication. Sixty day-case patients were randomly assigned into two groups i) oral Diazepam 0.1 mg kg^{-1} 60 minutes pre-

operatively, ii) same only 90 minutes and, iii) placebo. Again, no significant differences were established when employing self-rated measures and urinary cortisol monitoring. However, a significant difference in the level of catecholamines (products of adrenaline and nonadrenaline breakdown) was established between Group 1 and 3 (control) although not between Group 2 and 3.

Mealy *et al*, (1996) aimed to establish whether Propranolol 10 mg (β -blocking agent) could reduce anxiety in day-case patients. Patients were randomly assigned into two groups i) Propranolol 10 mg at 7.00 am prior to admission and, ii) same only placebo. The Propranolol group had significantly lower mean arterial blood pressure pre-operatively. Finally, in a survey by Hyde *et al*, (1998) 184 in-patients were asked about their preference for sedation. A researcher-designed questionnaire containing 10 "Yes/No" items was employed to determine the required level of sedation and preferred pre-operative activities. Light sedation was preferred by 54.1% of patients and listening to music or reading by 56.5%. Many preferred not to watch videos (62%) or to watch a video about their operation (76.6%).

D i s t r a c t i o n

The second anxiety management issue concerned the employment of distracting interventions i.e. music, television viewing, relaxation and visitors. Augustin and Hains (1996) evaluated the effectiveness of music on pre-operative anxiety. Forty-one day-case patients were randomly assigned into two groups i) 15 - 20 minutes listening to music of their choice via headphones and, ii) routine care. Patients in the experimental group had significantly lower heart rates immediately prior to surgery. However, there appeared to be an element of selection bias in the sample as the authors state "Some of the patients wanted to be aware of everything going on around them and they did not want to be distracted by listening to music." (p. 756). Lepage *et al*, (2001) randomly assigned patients held in a pre-operative waiting area into two groups i) listening to music of their choice via headphones and, ii) routine care. During this period patient-controlled sedation (Midazolam) was administered to all patients. No difference in anxiety was

established using self-rated questionnaires although the experimental group required less Midazolam to achieve the same relaxed state.

Miluk-Kolasa *et al*, (1996) evaluated the physiological effects of music playing using 100 patients undergoing in-patient surgery. On the day of surgery, following receipt of information regarding their operation, patients were randomly assigned into two groups i) listening to music via headphones for 1 hour before surgery and during recovery and, ii) routine care. Anxiety in both groups increased once the information concerning their surgery had been imparted although no significant difference was established using physiological measures. Steelman, (1990) also evaluated the effects of music on patient anxiety although intra-operatively. Forty-three day-case patients undergoing local and regional anaesthesia were randomly assigned into two groups i) headphones playing tranquil music intra-operatively and, ii) routine care (verbal distraction). No significant difference was established between the groups using self-rated measures. However, all patients experienced decreased anxiety in the post-operative period although the experimental group had a significant reduction in blood pressure post-operatively whereas the control group did not.

Winter *et al*, (1994) studied 62 in-patients admitted on the morning of their surgery. Patients were randomly assigned into two groups i) music of choice via headphones in surgical holding area and, ii) no music. No significant difference was established between the groups although the experimental group reported lower anxiety. Wang *et al*, (2002) randomly assigned 93 day-case patients into two groups i) music of choice via headphone for 30 minutes and, ii) control group (headphones with no music for 30 minutes). Using self-reported measures patients who could listen to music of their choice reported lower anxiety. However, the validity of the control group methodology must be questioned i.e. how many patients would keep their headphones in place with no music playing?

Friedman *et al*, (1992) observed the effects of television viewing on pre-operative anxiety in 69 in-patients. Patients were randomly assigned into two groups i) television viewing and, ii) routine care. Only patients who were observed to spend more than one-hour watching television

were included. Utilising the STAI the one-hour minimum television-viewing group were significantly less anxious than the control group. However, this may be somewhat bias as the more relaxed patients may choose to be distracted more by viewing the television i.e. these patients may have been less anxious irrespective of television viewing. The assumption that it was due merely to viewing television may be an erroneous one. Markland & Hardy, (1993) attempted to determine the effectiveness of guided relaxation prior to anaesthesia. Thirty-one day-case patients undergoing general anaesthesia were randomly assigned into three groups i) tape recorded relaxation, ii) tape recorded short story (attention-control) and, iii) hospital radio. Audiotape listening occurred for all patients (22 minutes duration) on the ward immediately prior to going to theatre. Both the relaxation group and tape-recorded short story group experienced reduced anxiety and required less time to be induced. However, the relaxation group were significantly more anxious prior to surgery. This may indicate that participants in the relaxation group opted to be part of the experimental group as they were very anxious and may have accepted the offer of relaxation in order to manage their anxiety more effectively.

In the final study undertaken by Poole, (1993) 40 in-patients, admitted on the day of surgery, were studied to determine the effects of visitors in the post-anaesthetic recovery unit i.e. stage one recovery. Once admitted, patients were randomly assigned into two groups i) visitor for 15 minutes in the post-anaesthetic recovery unit (once vital sign were stable) and, ii) no visitor. Seventy-five to 80% of patients could recall their stay in the post-anaesthetic recovery unit the following day. Additionally, the patients who received a visitor were significantly less anxious 24 hours post-operatively.

In summary, anxiolytic pre-medication was largely viewed as positive. An association between an extended stay in day surgery facilities and benzodiazepine pre-medication use was not established. Nevertheless, an increase in the number of patients utilising pre-operative sedation may ultimately impinge upon discharge from a day surgery facility. Patient-controlled pre-medication appeared to be no more effective than fixed dose medication and Propofol was frequently cited as the induction agent of choice. Additionally, drug absorption rates and anxiety

were not correlated. Of particular note was the premise for pre-medication i.e. reduction in anaesthetic requirements. Such pharmacological treatment can only be provided to patients in hospital and identified as anxious. However, in a study by Badner *et al*, (1990) patients who were highly anxious on the day on surgery were also highly anxious 12 hours prior to surgery. Additionally, in a study by Voulgari *et al*, (1994) it was concluded that 10% of the sample remained anxious for several days following surgery. Clearly, therefore, any effective pre-operative psychological plan of care must move beyond mere pharmacological management and extend further than the day of surgery. Furthermore, medical staff undertook virtually all of the above studies utilising physiological assessment as the main gauge of anxiety. Although physiological measurement of anxiety is viewed as very objective, it is not the only method. Much valuable information can be lost by the omission of other subjective methods of data collection. However, it recognised that such a focus has arisen for the medical staff as raised anxiety has clinical implications for anaesthesia.

Some evidence exists regarding the positive effects of music both pre-operatively and intra-operatively. However, in four studies, a significant difference was only established objectively i.e. physiological measures only. Subjectively, only one study established a difference thereby music may only be a little more effective than other methods of distraction. Patient choice appears to have a major influence in its effectiveness as an element of selection bias indicated that not all patients desired music as a distracter. Additionally, patients who wanted music desired a personal choice of music. This also arose with television viewing and guided relaxation i.e. no significant results occurred only an indication that patients required a choice of such methods. A visitor briefly entering the stage-one recovery area was, however, viewed as very positive.

Future Research Challenges

Two main challenges have arisen from this literature review i) patient anxiety as a clinical versus individual issue and, ii) limited therapeutic interventions. Firstly, medical staff undertook 65% of the studies within this review (Table 1). As a consequence within the 'Clinical Concerns'

and 'Anxiety Management' sections a medical focus predominates. The studies demonstrate the medical profession's considerable concern with safe, effective anaesthesia and customarily employ rigid, objective measures to obtain such evidence i.e. physiological indices. Subsequently the main treatment to emerge is the maintenance of physiological equilibrium i.e. sedatives, in order to avoid possible complications prior to and during anaesthesia. However, such interventions could be viewed as limited only to a select number of patients who have been perceived as highly anxious. Additionally, such intervention is only available in the acute stages (while the patient is in hospital) and is not available to day surgery patients. Although a lack of anaesthetic incidents is essential, from a therapeutic view, mere sedation may appear somewhat limited and lack a degree of sophistication. Current anxiety management appears to be dominated more by the desire for clinical efficiency than by effective individual requirements. The focus for future studies must therefore be the gaining of a balance between safety and individual desires.

The second and related challenge concerns the main interventions currently pursued i.e. pre-medication and distraction. Sedation is very problematic, as highlighted. Distraction is of value (many day surgery patients only experience this) although it has no formally agreed basis, is restricted by local policies/ facilities, is of no benefit to many patients and is frequently the last desperate attempt employed by nurses to alleviate acute anxiety. The constant focus upon such limited interventions is a fatal flaw in the philosophical and methodological construction of such studies. More subtle and therapeutic interventions are required in this new era of modern surgery. The challenge for the nursing profession is to uncover therapeutic interventions fit for this new surgical era. Therefore, it is essential for more research to be undertaken to examine patients' emotional experiences. Recommendations can then be put forward and presented in a clinically appropriate manner so that progress can finally be made. In this way, tangible psycho-educational elements of nursing intervention may be constructed and care, fit for the surgical patient in the 21st Century, implemented.

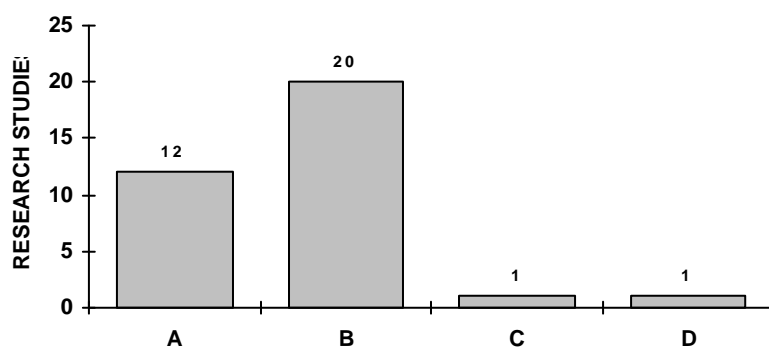
TABLE 1
PRIMARY AUTHOR

	MEDICAL STAFF	NURSING STAFF	SOCIAL SCIENTIST
	Badner et al (1990) Bernard et al (1996) Birch et al (1993) Cobley et al (1991) Daoud & Hasan (1999) Duggan et al (2002) Hahm et al (2002) Hyde et al (1998) Lepage et al (2001) Lydon et al (1998) Maranets & Kain (1999) Martens-Lobenhoffer et al (2001) McCleane & Watters (1990) Mealy et al (1996) Miluk-Kolasa et al (1996) Murdoch & Kenny (1999) Storm et al (2002) Voulgari et al (1994) Wikinski et al (1994) Wittenberg et al (1998) Wang et al (2002) Zvara et al (1994)	Augustin & Hains (1996) Beddows (1997) Calvin & Lane (1999) Friedman et al (1992) Poole (1993) Smith & Pittaway (2002) Steelman (1990) Winter et al (1994)	Boeke et al (1992) Jelcic & Bonke (1991) Markland & Hardy (1993) Winwood & Jago (1993)
TOTAL	22	8	4
34			

TABLE 2
METHOD OF RESEARCH

	EXPERIMENTAL RESEARCH DESIGN	SURVEY
	Augustin & Hains (1996) Beddows (1997) Bernard et al (1996) Duggan et al (2002) Friedman et al (1992) Hahm et al (2002) Lepage et al (2001) Lydon et al (1998) Markland & Hardy (1993) Mealy et al (1996) Miluk-Kolasa et al (1996) Poole (1993) Steelman (1990) Wang et al (2002) Wikinski et al (1994) Wittenberg et al (1998) Winter et al (1994) Winwood & Jago (1993)	Badner et al (1990) Birch et al (1993) Boeke et al (1992) Calvin & Lane (1999) Cobley et al (1991) Daoud & Hasan (1999) Hyde et al (1998) Jelcic & Bonke (1991) Maranets & Kain (1999) Martens-Lobenhoffer et al (2001) McCleane & Watters (1990) Murdoch & Kenny (1999) Smith & Pittaway (2000) Storm et al (2002) Voulgari et al (1994) Zvara et al (1994)
TOTAL	18	16
34		

FIGURE 1
RESEARCHER COUNTRY OF ORIGIN (based on primary researcher)



- A) USA and CANADA
- B) EUROPE
- C) KOREA
- D) SOUTH AMERICA

References

- Augustin, P. and Hains, A. A. (1996) Effects of music on ambulatory surgery patients' pre-operative anxiety. American Operating Room Nurses' Journal. 63(4), 750 - 758.
- Badner, N. H., Nielson, W. R., Munk, S., Kwiatkowska, C. and Gelb, A. W. (1990) Pre-operative anxiety: detection and contributing factors. Canadian Journal of Anaesthesia. 37(4), 444 - 447.
- Beddows, J. (1997) Alleviating pre-operative anxiety in patients: a study. Nursing Standard. 11(37), 35 - 38.
- Bernard, J. M., Faintreny, A., Leinhart, A. and Souron, R. (1996) Patient-controlled premedication by I.V. Midazolam for ambulatory surgery. Acta Anaesthesiologica Scandinavica. 40(3), 331 - 337.
- Birch, B. R. P., Chakraborty, R. and Miller, R. A. (1993) Anxiety in patients undergoing local anaesthetic day-case cystoscopy. Journal of One-Day Surgery. 3, 15 - 17.
- Boeke, S., Jelacic, M. and Bonke, B. (1992) Pre-operative anxiety variables as possible predictors of post-operative stay in hospital. British Journal of Clinical Psychology. 31(3), 366 - 368.
- Calvin, R. L. and Lane, P. L. (1999) Peri-operative uncertainty and state anxiety of orthopaedic surgical patients. Orthopaedic Nursing. 18(6), 61 - 66.
- Cobley, M., Dunne, J. A., and Sanders, L. D. (1991) Stressful pre-operative preparation procedures: the routine removal of dentures during pre-operative preparation contributes to pre-operative distress. Anaesthesia. 46(12), 1019 - 1022.
- Daoud, Z. A. and Hasan, M. A. (1999) Day surgery: the effect of anxiety on induction of anaesthesia and insertion of the laryngeal mask airway. Journal of One-Day Surgery. 9(2), 12 - 13.
- Department of Health (2000) The N.H.S. Plan - Creating a 21st Century N.H.S. London: HMSO.
- Duggan, M., Dowd, N., O'Mara, D., Harmon, D., Tormey, W. and Cunningham, A. J. (2002) Benzodiazepine premedication may attenuate the stress response in daycase anesthesia: a pilot study. Canadian Journal of Anaesthesia. 49(9), 932 - 935.
- Egbert, L. D., Battit, G. E., Welch, C. E. and Bartlett, M. K. (1964) Reduction of post-operative pain by encouragement and instruction of patients. New England Journal of Medicine. 270(16), 825 - 827.
- Friedman, S. B., Badere, B. and Fitzpatrick, S. (1992) The effects of television viewing on preoperative anxiety. Journal of Post-Anesthesia Nursing. 7(4), 243 - 250.
- Fung, D. and Cohen, M. (2001) What do out-patients value most in their anesthesia care? Canadian Journal of Anesthesia. 48(1), 12 - 19.
- Hahm, T. S., Cho, H. S., Lee, K. H., Chung, I. S., Kim, J. A. and Kim, M. H. (2001) Clonidine premedication prevents preoperative hypokalemia. Journal of Clinical Anesthesia. 14(1), 6 - 9.
- Hazelgrove, J. F. and Robins, D. W. (2002) Caring for the carer: An audit of the day surgery services for carers within the Wessex Region of England. International Journal of Ambulatory Surgery. 8(1), 13 - 18.
- Hyde, R., Bryden, F. and Asbury, A. J. (1998) How would patients prefer to spend the waiting time before their operations? Anaesthesia. 53(2), 192 - 200.
- Jelacic, M. and Bonke, B. (1991) Pre-operative anxiety and motives for surgery. Psychological Reports. 68(3), 849 - 850.
- Johnston, M. and Vogeles, C. (1993) Benefits of psychological preparation for surgery : A meta analysis. Annals of Behavioural Medicine. 15(4), 245 - 256.
- Leinonen, T., Leino-Kilpi, H., Ståhlberg, M-R. and Lertola, K. (2001) The quality of peri-operative care: development of a tool for the perceptions of patients. Journal of Advanced Nursing. 35(2), 294 - 306.
- Lepage, C., Drolet, P., Girard, M., Grenier, Y. and DeGagne, R. (2001) Music decreases sedative requirements during spinal anesthesia. Anesthesia and Analgesia. 93(4), 912 - 916.
- Lydon, A., McGinley, J., Cooke, T., Duggan, P. F. and Shorten. (1998) Effect of anxiety on the rate of gastric emptying of liquids. British Journal of Anaesthesia. 81(4), 522 - 525.
- Male, C. G. (1981) Anxiety in day surgery patients. British Journal of Anaesthesia. 53(6), 663P.
- Maranets, I. and Kain, Z. N. (1999) Pre-operative anxiety and intra-operative anesthetic requirements. Anesthesia and Analgesia. 89(6), 1346 - 1351.
- Markland, D. and Hardy, L. (1993) Anxiety, relaxation and anaesthesia for day case surgery. British Journal of Clinical Psychology. 32(4), 493 - 504.
- Martens-Lobenhoffer, J., Eisenhardt, S., Troger, U., Rose, W. and Meyer, F. P. (2001) The effect of anxiety and personality on the pharmacokinetics of oral midazolam. Anesthesia and Analgesia. 92(3), 621 - 624.

- Mathews, A and Ridgeway, V. (1984) Psychological preparation for surgery. In Steptoe, A. and Mathews, A. (eds.) *Health Care and Human Behaviour*. London : Harcourt Brace Jovanovch. p. 231 - 259
- McCleane, G. J. and Cooper, R. (1990) The nature of pre-operative anxiety. *Anaesthesia*. 45(2), 153 - 155.
- McCleane, G. J. and Watters, C. H. (1990) Pre-operative anxiety and serum potassium. *Anaesthesia*. 45(7), 583 - 585.
- Mealy, K., Ngeh, N., Gillen, P., Fitzpatrick, G., Keane, F. B. V. and Tanner, A. (1996) Propranolol reduces the anxiety associated with day case surgery. *European Journal of Surgery*. 162(1), 11 - 14.
- Miller, S. M. (1987) Monitoring and blunting: validation of a questionnaire to assess styles of information seeking under threat. *Journal of Personality and Social Psychology*. 52(2), 345 - 353.
- Miller, S. M., Combs, C. and Stoddard, E. (1989) Information, coping and control in patients undergoing surgery and stressful medical procedures. In Steptoe, A. and Appels, A. (eds.) *Personal Control and Health*. Chichester : Wiley. p. 107 - 130.
- Miluk-Kolasa, B., Matejek, M. and Stupnicki, R. (1996) The effects of music listening on changes in selected physiological parameters in adult pre-surgical patients. *Journal of Music Therapy*. 33(3), 208 - 218.
- Mishel, M. H. (1981) The measurement of uncertainty in illness. *Nursing Research*. 30, 258 - 263.
- Mitchell, M. J. (1997) Patients' perceptions of pre-operative preparation for day surgery. *Journal of Advanced Nursing*. 26(2), 356 - 363.
- Mitchell, M. J. (2000a) Psychological preparation for patients undergoing day surgery. *International Journal of Ambulatory Surgery*. 8(1), 19 - 29.
- Mitchell, M. J. (2000b) Anxiety management: a distinct nursing role in day surgery. *International Journal of Ambulatory Surgery*. 8(3), 119 - 128.
- Mitchell, M. J. (2003) Methodological challenges in the study of psychological recovery from modern surgery. *Nurse Researcher*. (In press).
- Munafo, M. R. and Stevenson, J. (2001) Anxiety and surgical recovery; reinterpreting the literature. *Journal of Psychosomatic Research*. 51(4), 889 - 596.
- Murdoch, J. A. C. and Kenny, G. N. C. (1999) Patient-maintained Propofol sedation as premedication in day-case surgery: assessment of a target-controlled system. *British Journal of Anaesthesia*. 82(3), 429 - 431.
- N.H.S Management Executive Value for Money Unit (1991) *Day Surgery: Making it Happen*. London: HMSO.
- Neale, J. M. and Liebert, R. M. (1986) 3rd Ed. *Science and Behaviour: An Introduction to Methods of Research*. London: Prentice-Hall.
- Pfisterer, M., Ernst, E. M., Hirlekar, G., Maser, P., Shaalan, A. K., Haigh, C. and Upadhyaya, B. (2001) Post-operative nausea and vomiting in patients undergoing day-case surgery: an international, observational study. *International Journal of Ambulatory Surgery*. 9(1), 13 - 18.
- Poole, E. L. (1993) The effects of post-anesthesia care unit visits on anxiety in surgical patients. *Journal of Post Anesthesia Nursing* 8(6), 386 - 394.
- Ramsay, M. A. E. (1972) A survey of pre-operative fear. *Anaesthesia*. 27(4), 396 - 402.
- Rothrock, J. C. (1989) Peri-operative nursing research. Part I : Pre-operative psycho-educational interventions. *Association of Operating Room Nurses` Journal*. 49(2), 597 - 619.
- Smith, A. F. and Pittaway, A. J. (2002) Premedication for anxiety in adult day surgery. (Cochrane Review). In : *The Cochrane Library*. Issue 3. Oxford: Update Software.
- Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R. and Jacobs, G. A. (1983) *Manual for the State-Trait Anxiety Inventory for Adults*. Palo Alto California: Consulting Psychologists Press.
- Steelman, V. M. (1990) Intra-operative music therapy. *American Operating Room Nurses' Journal*. 52(5), 1026 - 1034.
- Storm, H., Myre, K., Rostrup, M., Stokland, O., Lien, M. D. and Raeder, J. C. (2002) Skin conductance correlates with peri-operative stress. *Acta Anaesthesiologica Scandinavica*. 46(7), 887 - 895.
- Suls, J. and Wan, C. K. (1989) Effects of sensory and procedural information on coping with stressful medical procedures and pain: A meta analysis. *Journal of Consulting and Clinical Psychology*. 57(3), 372 - 379.
- Tierney, A. (1999) Report to N.H.S Executive Research and Development Programme. Information needs pre and post-discharge: A qualitative study of the perceptions and experiences of patients and carers. University of Edinburgh.
- Voulgari, A., Papanikolaou, M. N., Lykouras, L., Alevizos, B., Alexiou, E. and Christodoulou, G. N. (1994) Prevention of post-operative anxiety and depression. *Bibliotheca Psychiatrica*. 165, 49 - 55.

- Wang, S-M., Kulkarni, L., Dolev, J. and Kain, Z. N. (2002) Music and preoperative anxiety: a randomized, controlled study. Anesthesia and Analgesia. 94(6), 1489 - 1494.
- Wikinski, S., Lombardo, M., Medina, J. H. and Rubio, M. C. (1994) Lack of anxiolytic effect of diazepam in pre-anaesthetic medication. British Journal of Anaesthesia. 72(6), 694 - 696.
- Wilson, J. F. (1981) Behavioural preparation for surgery : benefit or harm? Journal of Behavioural medicine. 4(1), 79 - 102.
- Winter, M, J., Paskin, S., and Baker, T. (1994) Music reduces stress and anxiety of patients in the surgical holding area. Journal of Post-Anesthesia Nursing. 9(6), 340 - 343.
- Winwood, M. A. and Jago, R. H. (1993) Anxiety levels following anaesthesia for day case surgery. Anaesthesia. 47(7), 581 - 584.
- Wittenberg, M. I., Lark, T. L., Butler, C. L., Handy, R. M., Schwanky, H. D., Tait, A. R. and Tremper, K. K. (1998) Effects of oral diazepam on intravenous access in same day surgery patients. Journal of Clinical Anesthesia. 10(1), 13 - 16.
- Zigmond, A. S. and Snaith, R. P. (1983) The hospital anxiety and depression scale. Acta Psychiatrica Scandinavica. 67(6), 361 - 370.
- Zvara, D. A., Manning, M., Stewart, T., McKinley, A. C. and Cran, W. (1994) Pre-operative anesthetic concerns: perceptions versus reality in men and women. Anesthesiology. 81(3A), A1260.