

**WAITING FOR CARE: A STUDY OF PHYSICAL AND
PSYCHOLOGICAL SYMPTOMS AND HEALTHCARE
UTILIZATION FOR PAIN WHILST WAITING FOR
GYNAECOLOGICAL SURGERY**

by

Sarah Walker

A thesis submitted to the School of Nursing

In conformity with the requirements for

The Degree of Master of Science

Queen's University

Kingston, Ontario, Canada

(September, 2009)

Abstract

There is a growing interest in the impact of waiting for surgery, a common experience for many Canadians. Pain and psychological symptoms prior to surgical management are frequently problems for women with gynaecological conditions, however minimal research was found to investigate pain and psychological symptoms in these women prior to surgery. Also pain is recognized to increase healthcare utilization, but this has not been previously examined in this population. The objectives of this research project were to examine levels of pain, psychological factors associated with pain and frequency of healthcare utilization due to pain in a population of women waiting for gynaecological surgery, predominantly undergoing hysterectomies. Four hundred and twenty nine women in a tertiary care centre in southeastern Ontario were included in the study. Anxiety was measured using the State Trait Anxiety Inventory (STAI), depression with the Centre for Epidemiologic Studies Depression Scale (CES-D), somatization using the Seven Symptom Screening Test (SSST) and catastrophizing was measured using an abbreviated coping strategies questionnaire (CSQ). Pain was assessed using the Brief Pain Inventory (BPI). Women also reported on their healthcare utilization for pain over the past 12 months. The length of wait was obtained from hospital waiting data. Results showed a moderate to severe pain intensity score occurred in 30.5% of women and a moderate to severe interference score in 31.5%. Being younger, married, employed and with high trait anxiety were factors associated with higher rates of healthcare utilization. High levels of depression, somatization and catastrophizing were associated with higher pain intensity and interference scores. This study supports the need for preoperative

assessment of physical and psychological symptoms in women waiting for gynaecological surgery. Improving patients' health prior to surgery will potentially reduce their healthcare demands on a financially constrained healthcare service.

Co-Authorship

Elizabeth G. VanDenKerkhof RN, DrPH
Associate Professor
School of Nursing & Dept of Anesthesiology
Queen's University
Kingston General Hospital
76 Stuart St.
Kingston, Ontario, Canada K7L 2V7
613-549-6666, x3964
FAX 613-548-1375
Email: ev5@queensu.ca

Margaret B. Harrison, RN, PhD
Professor, School of Nursing
Queen's University
Rm 200 - 78 Barrie Street
Kingston, Ontario, Canada K7L 3N6
TEL: 613-533-6000 ext 74760
FAX: 613-533-6331
EMAIL: margaret.b.harrison@queensu.ca

Wilma M. Hopman, BAH, MA
Faculty, Department of Community Health and Epidemiology, Queen's University
Staff, Clinical Research Centre, Kingston General Hospital
Angada 4, Room 5-426
76 Stuart Street, Kingston, Ontario
K7L 2V7
Phone 613 549 6666, ext. 4941
Fax 613 548 2428
Email hopmanw@kgh.kari.net

Each of the co-authors provided feedback on the study design and contributed to the conceptualization of this thesis. Margaret Harrison and Elizabeth VanDenKerkhof provided guidance with the synthesis of the literature. Wilma Hopman and Elizabeth VanDenKerkhof provided critique of the analysis. All co-authors assisted with synopsis of findings and offered editorial contributions towards the final approved version of the thesis.

Acknowledgements

I would like to sincerely thank my supervisor Dr. Elizabeth VanDenKerkhof for her expert guidance and endless patience throughout the process of composing this thesis. I would also like to thank my committee members, Margaret Harrison and Wilma Hopman for giving me direction and continued support.

I have been challenged by the process and am proud of my achievements. These two years would not have been made possible without the love and encouragement from family and friends both in the UK and Canada. Thank you all for supporting me through this experience, as I now take what I have learnt with me and continue the journey!

Table of Contents

Abstract.....	ivi
Co-Authorship.....	iv
Acknowledgements.....	v
List of Figures.....	viii
List of Tables.....	ix
Chapter 1.....	1
Introduction.....	1
Chapter 2.....	5
Literature Review.....	5
Conceptual Framework.....	7
Background to Study.....	13
Purpose of the Study.....	20
Chapter 3 Manuscript A.....	22
The Association between Psychological Characteristics and Pain in Women Waiting for Gynaecological Surgery.....	22
Abstract.....	23
Introduction.....	25
Methods.....	27
Results.....	35
Discussion.....	37
References.....	43
Chapter 4 Manuscript B.....	69
The Association between Symptoms and Healthcare Utilization in Women Waiting for Gynaecological Surgery.....	69
Abstract.....	70
Introduction.....	72
Methods.....	74
Results.....	82
Discussion.....	86
References.....	94
Chapter 5.....	120

Waiting for Surgery: Pain & Psychological Symptoms

Overview of Findings.....	120
Implications and Future Recommendations.....	125
Appendix A Questionnaires.....	128
Appendix B Wait Time Strategy Priority Scores.....	1466
References.....	1477

List of Figures

Figure 2.1 Conceptual Framework – Theory of Unpleasant Symptoms9

Figure 2.2 Conceptual Framework adapted to study..... 10

Figure 3.1 Total number of participants using each pain descriptor.....67

Figure 3.2 Total number of pain descriptors used by each study participant.....68

List of Tables

Table 2.1 Synthesis Table of Studies Identified in Background Literature Using the Theory of Unpleasant Symptoms.....	12
Table 3.1 Baseline Characteristics of Women Waiting for Gynaecological Surgery	51
Table 3.2 a Pain Intensity Scores Obtained from the Brief Pain Inventory for All Participants and Women with Pain.....	55
Table 3.2 b Pain Interference Scores Obtained from the Brief Pain Inventory for All Participants and Women with Pain.....	56
Table 3.3 Bivariate and Multivariable results for Pain Intensity Scores.....	57
Table 3.4 Bivariate and Multivariable results for Pain Interference Scores.....	62
Table 4.1 Baseline Characteristics.....	103
Table 4.2 Table 4.2 Number of Healthcare Utilization Visits to Practitioners for Pain During 12 Months Prior to Surgery.....	107
Table 4.3 Bivariate and Multivariable results for Healthcare Utilization <3 or ≥3 visits in past 12 months for pain.....	108
Table 4.4 Healthcare Utilization Emergency Room visits in past 12 months for pain - Yes or No.....	113

Chapter 1

Introduction

In 2005 1.6 million people over 15 years of age had elective surgery in Canada. The growing demand upon healthcare services has led to an increase in waiting time for treatment, in particular elective surgical procedures (Hilkuysen, Oudhoff, Rietberg, van der Wal, & Timmermans, 2005). Pain, a significant problem among general populations (Blyth et al., 2001; Mantyselka et al., 2001; Tripp, VanDenKerkhof & McAlister, 2006), is frequently a feature for patients waiting for surgical procedures. Patients often require additional healthcare visits to improve pain management (Barsky, Orav & Bates, 2006; McClish et al., 2006; Von Korff, Lin, Fenton, & Saunders, 2007); a study in Finland found 29% of visits to a family physician were because of pain (Mantyselka et al., 2001) and the Canadian Pain Consortium (2001) found 80% of all physician visits had a pain-related component. As a result of increased healthcare utilization there is an escalation in healthcare expenditure (Kjerulff, Frick, Rhoades & Hollenbeak, 2007). Elevated levels of pain can interfere with physical activity and can increase the risk of unemployment (Von Korff & Dunn, 2008) and also negatively impact society through increasing work related absenteeism (Mantyselka et al.).

Recognition of the importance of pain management and patient rights to pain treatment have been established within the Canadian Pain Coalition Charter (2003) and the Joint Commission for Accreditation of Healthcare Organization (JCAHO) standards (2001), whose aim is to promote pain management by healthcare professionals. Women frequently experience pain with gynaecological conditions (Martin, 2006). A prevalence

study by Grace and Zondervan (2004) found chronic pelvic pain in 25.4% of women within the general population. In a systematic review studying women with chronic pelvic pain, the prevalence of dysmenorrhoea (severe uterine pain during menstruation) was found to vary from 17% to 81% (Latthe, Latthe, Say, Gulmezoglu, & Khan, 2006). However, it is not known to what extent women waiting for gynaecological surgery utilize healthcare for pain. This study therefore intends to gain greater understanding of the complexities of pain in this population and how this impacts healthcare utilization whilst waiting for gynaecological surgery.

This research project utilized data collected preoperatively in a prospective study, the aim of which was to understand chronic pain following surgery in women. The primary purpose for this cross-sectional study was to gain a better understanding of pre-surgical pain in women prior to gynaecological surgery, through examination of pain, psychological characteristics and healthcare use in these women.

Understanding pain will enable healthcare practitioners to provide better clinical care. Evidence of the pain intensity, pain interference, psychological factors and healthcare utilization because of pain is presented. Improving knowledge of the current situation will assist healthcare professionals to examine ways of lowering healthcare utilization and reduce healthcare costs. In particular, this study will provide information for healthcare practitioners in the primary care setting. Through improved awareness of factors that affect patients with pain, care can then be directed towards areas of need and preventative action can be undertaken to decrease pain and healthcare utilization in women who are waiting for surgery.

Conceptual Framework

The conceptual framework, the Theory of Unpleasant Symptoms by Lenz, Pugh, Milligan, Gift and Suppe (1997), was used to guide this research. This theory illustrates the relationship between situational, psychological and physiological factors that affect an individual and the symptoms they experience, and these symptoms are shown to influence the individuals through an outcome or activity (performance). The theory also acknowledges that the resulting performance can consequently have a feedback effect on the situational, psychological and physiological characteristics. The symptom of focus in this study is pain prior to gynaecological surgery. Further explanation of the theory application can be found in Chapter 2.

Measurement Tools

Upon admission for surgery patients were invited to take part in the study. Following confirmation of eligibility and obtaining consent, they self-completed 5 questionnaires gathering information on pain, psychological factors and healthcare utilization (see Appendix A). The use of questionnaires is appropriate as pain research is a subjective phenomenon and therefore is only able to be measured indirectly (Turk & Melzack, 2001 p4).

Organization of Thesis

This thesis follows a combined traditional and manuscript design, with traditional chapters followed by two manuscripts; all are organized using the American Psychological Association (APA) format. Chapter two is the background literature review addressing current knowledge of physical and psychological symptoms whilst waiting for surgery, in addition to examining healthcare utilization for pain. The conceptual

framework and research questions are also presented here. Chapter three is the first manuscript which reviews psychological characteristics and pain in women prior to gynaecological surgery; it has been prepared for submission to the journal of Pain. Chapter four is the second manuscript which reports on the study of gynaecological patients waiting for surgery and healthcare utilization for pain. This chapter has been prepared for submission to the Journal of Women's Health. The fifth and final chapter integrates results from both manuscripts and presents implications for future research and practice.

Chapter 2

Literature Review

Introduction

Waiting for care is a common experience for today's patients (Fogarty & Cronin, 2008; Irvin, 2001; Triffuax et al., 2001). The growing demand upon healthcare services has led to an increase in waiting time for treatment, in particular for elective surgical procedures (Hilkuysen, Oudhoff Rietberg, vander Wal, & Timmermans, 2005). In 2005, 1.6 million people over 15 years of age had elective surgery in Canada. The Canadian Institute for Health Information (CIHI) documented that 66% of these patients cited long waiting times (CIHI, 2006). In the same year Statistics Canada estimated 200,000 people expressed difficulties in getting non-emergency surgery (Statistics Canada, 2006). Between 1993 and 2008 waiting time for healthcare increased by 86% (Esmail, Hazel & Walker, 2008).

Ontario Strategy

Excessive waiting for healthcare is a concern of both healthcare providers and the public (Wait Time Strategy, 2004). In an effort to better understand the waiting time situation and to improve the provision of healthcare, the Ministry of Health and Long Term Care announced Ontario's Wait Time Strategy in November 2004 (Wait Time Strategy, 2008). Multidisciplinary experts in healthcare identified priority levels to determine the clinically appropriate length of waiting time for procedures. Four priority

levels were identified; 1) immediate, 2) within 4 weeks, 3) within 12 weeks and 4) within 26 weeks (See Appendix B).

As an example, in one area of care analyzing median waiting times for gynaecological treatment, data from an independent international research organization found a range from 8 to 18 weeks [126 days] in 2008. This is similar to Canada's median waiting time of between 6 and 17.8 weeks (Esmail et al., 2008). Although the Wait Time Strategy has currently not incorporated gynaecological procedures, a recent CIHI report recognized an initial reduction to have occurred in wait times within Canada among procedures for orthopaedic, bypass, and cataract surgery and radiation treatment (CIHI 2009; Closson, 2009). Management of waiting times for healthcare may be improving, but it remains a significant problem for the Canadian population.

Effect of Waiting for Surgery on Individuals and the Health Care System

Evidence is emerging about the physical and psychological effect on individuals waiting for surgery (Esmail et al., 2008), an experience frequently associated with inducing stress (Derrett, Paul & Morris, 1999; Irvin, 2001; Triffaux et al., 2001; Oudhoff, Timmermans, Knol, Bijnen, & van der Wal, 2007). In Canada, 49-71% of individuals waiting for surgery in 2005 were affected by worry, stress and anxiety (Statistics Canada, 2006). In addition, the physical impact of waiting might lead to exacerbation of symptoms, could increase physical disabilities and subsequently worsen a patient's long-term prognosis or even result in life threatening complications (Hilkhuisen et al., 2005).

Lengthy waiting times can result in patients needing additional appointments and medication due to progression of their condition (Hilkhuisen et al., 2005; Esmail et al., 2008; British Columbia Medical Association [BCMA] & CMA 2006; CMA 2008). As

well as influences on the patient, prolonged waiting times therefore have a negative economic effect on the healthcare system through greater utilization of services with subsequent increased costs (Canadian Medical Association [CMA], 2008). An example of the substantial economic burden of pain to healthcare services comes from Australia, where a total estimated cost of 34.3 billion dollars was spent in 2007 for 3.2 million chronic pain sufferers (MBF Foundation, 2007).

A study examining the prevalence of pain in southeastern Ontario reported that 16% of the population had high pain intensity and interference (Tripp et al., 2006). Visits to healthcare practitioners are frequently a result of pain (Mantyselka et al., 2001; Canadian Pain Consortium, 2001; Morley-Forster, Clark, Speechley, & Moulin, 2003). Given the emerging data on pain as a key issue in healthcare, the purpose of this study is to investigate the physical and psychological symptoms of women waiting for gynaecological surgery and to examine the frequency of healthcare utilization due to pain. The Theory of Unpleasant Symptoms was the conceptual framework used to guide this research.

Conceptual Framework

The Theory of Unpleasant Symptoms

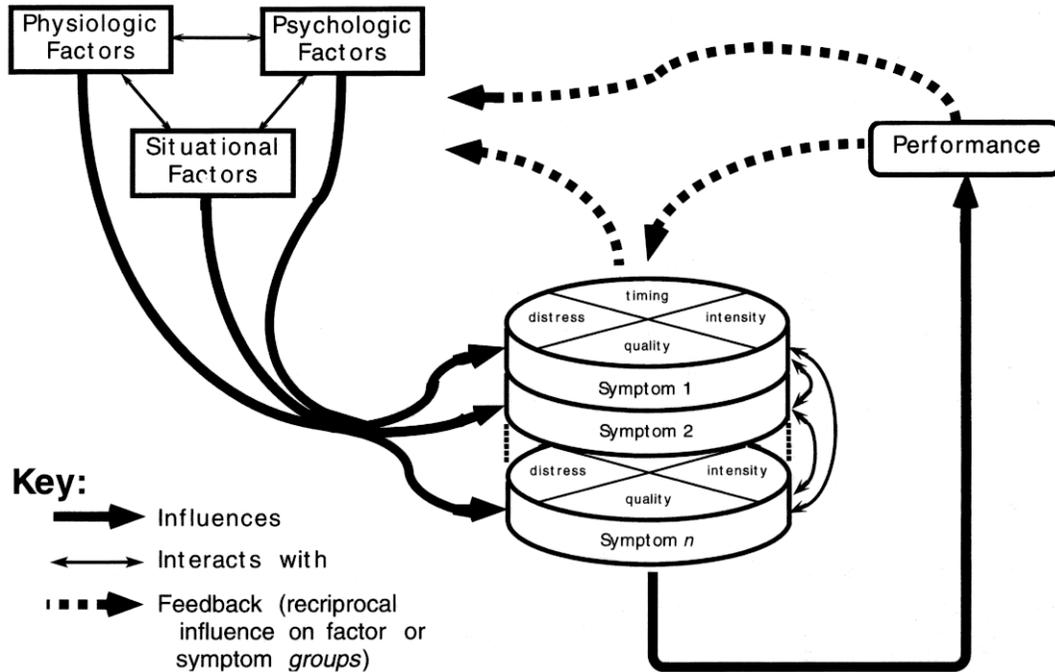
The Theory of Unpleasant Symptoms developed by Lenz, Suppe, Gift, Pugh and Miligan in 1995 is a descriptive illustration of symptoms. This theory was created to examine the concepts of fatigue and dyspnoea. It illustrates the interplay between situational, psychological, and physiological factors and their effect on the experience of

symptoms, which further affect performance, forming a feedback loop (Lenz, Pugh, Milligan, Gift, & Suppe, 1997).

The definition of the adjective “unpleasant” is not pleasant, displeasing, and disagreeable (Allen, 1990). Symptom is defined as a sign of the existence of something or evidence of a disease (Allen). In healthcare, a symptom could be labeled as a diagnostic indicator of a condition (Armstrong, 2003). Armstrong described the concept of ‘symptoms experience’, and recognized that each person reacts to a symptom subjectively. Therefore the degree of symptom experience and amount of suffering reported by individuals depends on how a symptom is perceived.

The Theory, updated in 1997, was altered to recognize that multiple symptoms can exist and interact with each other. Three main factors are recognized to influence each symptom: situational, psychological and physiological factors and the revised theory acknowledged that each variable has the potential to affect each other. However each symptom is also recognized in isolation and consists of multiple components: intensity, time, quality and distress. Multiple symptoms can be experienced by an individual and the theory recognizes symptom association. As a result of the interaction between the variables and components of each symptom, an effect or outcome transpires. The theory also hypothesizes a feedback loop from the level of performance on the symptom and the situational, psychological and physical factors (see Figure 2.1).

Figure 2.1 *Conceptual Framework – Theory of Unpleasant Symptoms*



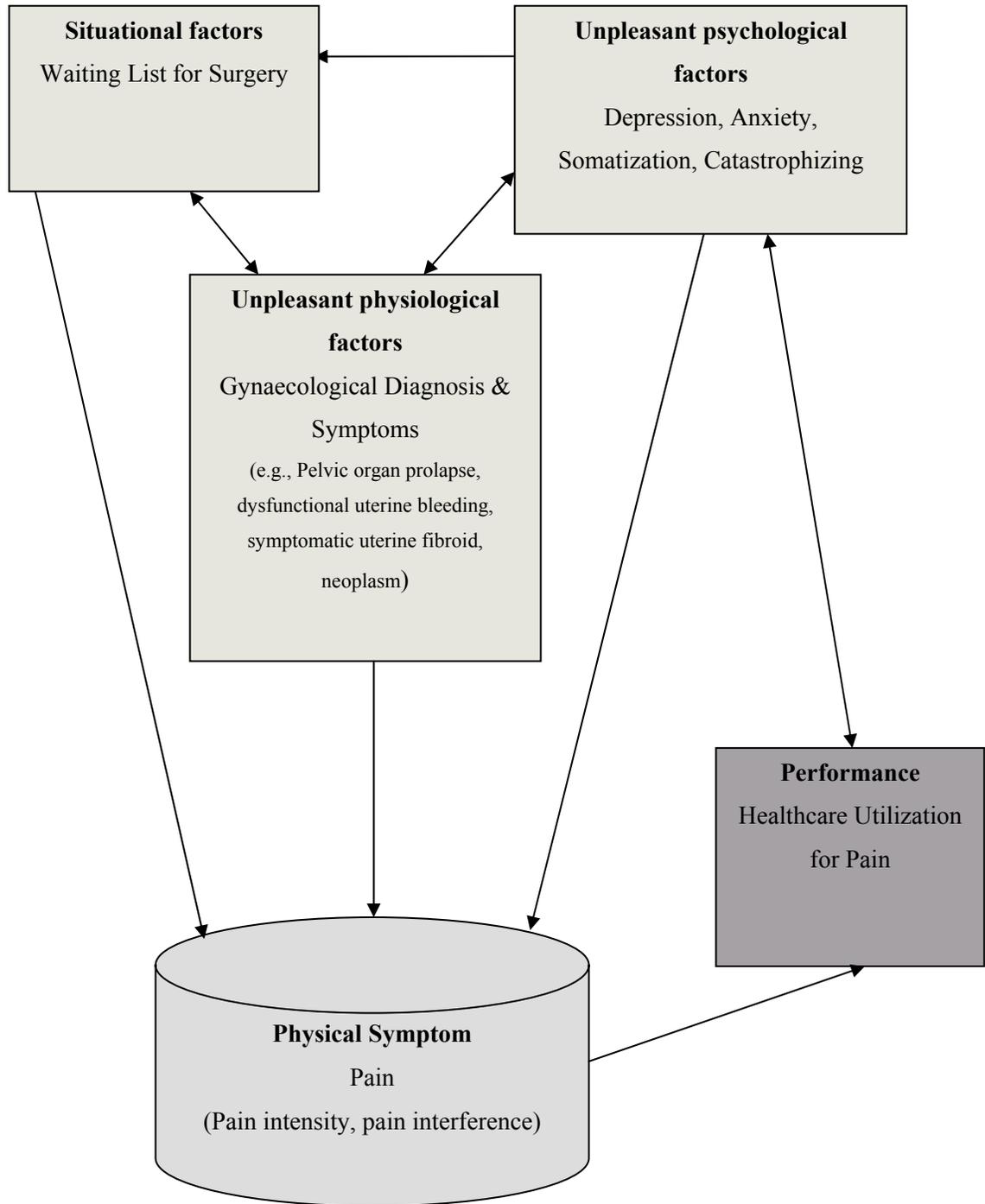
Lenz, Pugh, Milligan, Gift and Suppe (1997)

From “The middle-range theory of unpleasant symptoms: An update,” by E. R. Lenz, L.C. Pugh, R.A. Milligan, A. Gift, and F. Suppe, 1997, *Advances in Nursing Science*, 19(3), 14-27. Copyright 1997 by Wolters Kluwer Health. Reprinted with permission.

Application of Conceptual Framework

The Theory of Unpleasant Symptoms provides a useful conceptualization for this study in describing characteristics and symptoms of women waiting for scheduled gynaecological surgery as well as the possible interaction and sequelae (Figure 2). Social and cultural, psychological, and physical factors are increasingly recognized to have an influence on pain. This has become more evident as researchers have combined both the biomedical and psychosocial perspectives in an attempt to understand patients’ pain experiences (Andrasik, Flor, & Turk, 2005; Gatchel & Theodore, 2008).

Figure 2.2 *Conceptual Framework Adapted to Study*



In the adapted conceptual framework, being on a waiting list for surgery is the situational factor, psychological aspects to be examined include depression, anxiety, somatization and catastrophizing, the diagnosis of a gynaecological condition is the physiological factor and the unpleasant symptom to be reviewed is pain. The variable from the ensuing interaction of symptoms and characteristics to be considered, relates to healthcare utilization for pain. The performance of healthcare utilization may have a feedback effect on the situational, psychological and physiological factors, and it is also postulated within this conceptual framework that the feedback loop could affect the performance.

Previous studies have utilized the theory to focus on symptoms in chronic and acutely ill populations with a range of unpleasant symptoms (see Table 2.1).

Waiting for Surgery: Pain & Psychological Symptoms

Table 2.1 - Synthesis Table of Studies Identified in Background Literature Using the Theory of Unpleasant Symptoms

Author & Year	Study Design & Sample Size (n)	Study Focus	Outcome
McCann & Boore 2000	Cross sectional n = 39	Haemodialysis patients Fatigue, Quality of life (QOL)	Depression was significantly associated with QOL
Reishtein 2005	Cross sectional n = 100	Functional performance and symptoms with Chronic Obstructive Pulmonary Disease (COPD)	COPD patients → dyspnoea significantly related to fatigue and sleep difficulty.
Huth & Broome 2007	Secondary analysis of a Randomized Control Trial n = 76	Paediatric Tonsillectomy Pain Relaxation techniques/ imagery	No statistical differences between the patients that used imagery and those that did not in amount of fluid intake, pain and emesis. Link with vomiting and fluid intake.
Subocz et al., 2007	Cross-sectional n = 41	Caesarean section Pain, Health related Quality of Life (HRQOL)	Preoperative scores: depression, state anxiety, trait anxiety, Healthcare utilization - sought medical care due to pain.

McCann and Boore (2000) looked at patients with renal failure and identified the symptom of fatigue to be experienced by a majority of patients undergoing haemodialysis. Reishtein (2005) utilized the Theory of Unpleasant Symptoms when examining the association between patients' symptoms of fatigue, sleep difficulty and dyspnoea when patients have chronic obstructive pulmonary disease (COPD). In accordance with the theory, the results showed the interrelationship between the three symptoms. Huth and Broome (2007) looked at the outcomes of children following tonsillectomy and found that with the symptom of pain there was a link to vomiting and fluid intake in these patients. Subocz et al. (2007) also assessed the symptom of pain, looking at the impact on health related quality of life and healthcare utilization in women following caesarean section.

Background to Study

A literature search focusing on women undergoing surgery was carried out using the electronic databases Medline, Health and Psychosocial Instruments, Embase, and Cinahl for the period 1950-2009. The terms used were gynecology, gynaecology, preoperative, presurgical, unpleasant, symptom, pain, healthcare, utilization, anxiety, depression, somatization, catastrophizing and waiting. Of the literature found, none examined healthcare utilization for pain whilst waiting for gynaecological surgery. Within the studies that focused on gynaecological patients some compared preoperative and postoperative status whilst examining factors such as quality of life, satisfaction, psychological state, and pain (Weber, Walters, Schover, Church & Piedmonte, 1999; Stovall, Ling & Crawford, 1990); Rannestad, Eikeland, Helland, and Qvarnstrom, 2001; Hartmann, Lamvu, Langenberg, Steege, Kjerulff, 2004; Persson, Wijma, Hammer &

Kjohlhede, 2006). Psychological states of women with gynaecological conditions were examined in a small number of studies (Thornton, McQueen, Rosser, Kneale, and Dixon 1997; Kain, Sevarino, Alexander, Pincus & Mayes, 2001; Carr, Brockbank, Allen & Strike, 2006) and only some investigated pain with gynaecological conditions (Newton & Reading, 1980; Lumsden et al., 1994; Zondervan et al., 2001; Grace & Zondervan, 2004; Oudhoff, Timmermans, Bijnen, & van der Wal, 2004; Carr et al., 2006). The remaining studies identified in the literature search did not examine gynaecological patients. Studies examining waiting for surgery included general surgery (Oudhoff et al., 2004), cardiac surgery (Jalowiec & Grady, 1994; Jónsdóttir & Baldursdóttir, 1998) spinal surgery (Braybrooke et al., 2007), and orthopaedic surgery (Janzen & Hadjistatropoulos, 2008). A number of studies examined psychological factors and pain (Magni, Moreschi, Rigatti-Luchini, & Merskey, 1994; Bair, Robinson, Katon, & Kroenke, 2003; Tesch, Denardin, Baptista, & Dias, 2004) and healthcare utilization and pain featured in several studies (Chrubasik, Junck, Zappe, & Stutzke 1998; Tripp et al., 2006; Rohrer, Merry, Adamson, & Barnes, 2008; VanDenKerkhof et al., 2006).

Oudhoff et al. (2004) conducted a review of the literature and found that between 1985 and 2003, 7 studies were published on the influence of waiting for surgery on patients' physical, psychological and social factors. They reported that physical and psychological effects from waiting for surgery, if prolonged, may have a detrimental impact on patients' health.

A longitudinal study by Oudhoff et al. (2007) examined 505 patients waiting for varicose vein, inguinal hernia or gallstone surgery. Patients reported elevated anxiety levels and lower perceived general health status with longer waiting times. Jónsdóttir and

Baldursdóttir (1998) reported levels of physical and emotional problems in a retrospective survey of 72 patients awaiting coronary artery bypass graft. Eighty eight percent of patients were dissatisfied with their current health status and 61% described an increase in anxiety. Social, psychological and physical problems were reported by patients awaiting heart surgery. Similar preoperative stressors for patients awaiting heart transplant surgery were identified by Jalowicc et al. (1994). Triffaux et al. (2001) implemented psychological support for 22 heart transplant patients and identified a reduction in depression, anxiety and somatic complaints.

A prospective cohort study by Braybrooke et al. (2007), examining 53 patients undergoing posterior lumbar surgery, reported that longer waiting time can affect a patients' preoperative status. Patients with shorter waiting times showed a more desirable health score compared to patients who had longer waiting times. Janzen and Hadjistatropoulos's (2008) analysis of 38 patients found that anxiety and depression were predictors of concern about waiting for surgery.

Waiting for Gynaecological Surgery

There is a paucity of information about the preoperative symptoms and healthcare utilization of women waiting for gynaecological surgery, however there is evidence to suggest that they experience psychological and physical symptoms and increased healthcare utilization.

Psychological Symptoms

Anxiety and depression are the most frequently cited psychological conditions recognized to occur in patients waiting for gynaecological surgery. In a randomized controlled study, 119 women underwent preoperative psychometric tests prior to

hysterectomy. Although the study was not examining women on a waiting list, it showed improvements in levels of anxiety and depression in the postoperative assessment (Persson et al., 2006). Thornton et al. (1997), in a prospective study of 89 women identified a high level of negative mood states prior to hysterectomy. Fifty four percent of women were found to have anxiety and 26% had depression prior to hysterectomy. Hartmann et al. (2004) acknowledged the impact of psychological factors in women prior to hysterectomy. Fourteen percent in a sample of 1249 women had depression and an additional 13% had depression and pain. They recognized that women with both pain and depression at the time of their hysterectomy had poorer quality of life after surgery than women who had one or neither disorder.

Kain et al. (2001) examined 53 women in a prospective cohort study and found those with preoperative anxiety had higher postoperative anxiety and pain. In a mixed methods study of 80 women due to have gynaecological surgery, 41% reported preoperative anxiety. The qualitative analysis of 44 women in their study identified excessive waiting time as one of the causes of anxiety, although it was not reported how many women stated this (Carr et al., 2006).

Somatizing and catastrophizing, although not specifically acknowledged within the literature for women prior to gynaecological surgery, are recognized psychological conditions known to occur in general populations. Somatization comes from the word Soma, which means body, and here preoccupied thoughts can result in the manifestation of physical problems (Durand, Barlow & Stewart, 2008 chp. 5 p 178). Catastrophizing is understood to occur when an individual is not coping with their pain and as a result their mood becomes negatively affected (Linton 2005, chp. 6 p45).

Physical Symptoms

Women awaiting gynaecological surgery experience a number of unpleasant symptoms. Commonly reported conditions include urinary incontinence (Lose, 2005), dysmenorrhoea (severe uterine pain during menstruation) (Newton & Reading, 1980), dyspareunia (painful sexual intercourse) (Grace & Zondervan, 2004), metrorrhagia (bleeding at irregular intervals) and menorrhagia (abnormally heavy menstrual bleeding (Lindberg & Nolan, 2001). Indications for hysterectomy include myoma, endometrioses, ovarian cyst and pain (Weber, Walters, Schover, Church & Piedmonte, 1999). For many years pain has been identified in women with gynaecological symptoms (Stovall et al., 1990; Weber et al., 1999; Kain et al., 2001; Zondervan et al., 2001; Grace & Zondervan, 2004; Hartmann et al., 2004; Latthe, Latthe, Say, Gulmezoglu, & Khan, 2006). Types of pain include dysmenorrhoea, premenstrual pain, ovulatory pain and other cyclic pain which may develop into chronic pelvic pain (Martin, 2006).

Pain is a prevalent issue with gynaecological patients prior to surgical management. Lumsden et al. (1994) in a randomized control trial of 71 women found abdominal discomfort to be experienced in 52% of patients awaiting diagnostic laparotomy for a pelvic mass. Hartmann et al. (2004), in a prospective cohort study of 1249 women reported that 32% suffered from pain prior to hysterectomy. Rannestad, Eikeland, Helland, and Qvarnstrom (2001) also stated that pain is a common symptom and in a study of 111 women found that 61% experienced pelvic pain prior to hysterectomy. Similarly, Stovall et al. (1990) evaluated 99 women; and found that each had experienced pelvic pain for 6 months or longer before hysterectomy.

Healthcare Utilization

A few authors have examined the frequency of healthcare utilization, in particular to better understand reasons for increased use by some individuals (Barsky et al., 2006; McClish et al., 2006; Von Korff, Lin, Fenton, & Saunders, 2007). A majority of literature on healthcare utilization relates to primary care visits to a healthcare practitioner, recognizing pain as a primary symptom presented by the patient (Knapp & Koch, 1984; Mantyselka et al., 2001). Chrubasik et al. (1998) carried out a survey on individuals experiencing pain that lasted 6 months or longer and found that people with more than one pain site and higher pain intensity had a greater number of healthcare visits.

A recent cross-sectional study conducted by Rohrer et al. (2008) analyzed the number of visits 1445 patients undertook to their physician. Focusing on the frequency of healthcare visits by patients with pain, they found those with severe pain had the most visits in contrast to patients with lower pain scores. In a pilot study examining 30 women undergoing elective caesarean section, Subocz et al. (2007) identified that during the 12 months prior to surgery 66% of women sought medical care due to pain. Von Korff et al. (2007) found corresponding results when examining patients over a 3 year period. Patients with pain had increased use of healthcare when compared to age-sex matched controls. Rohrer et al. established that patients reporting severe pain had a greater number of physician visits than patients with lower pain scores.

Although limited research is available, there is emerging evidence that gynaecological patients can be negatively affected by pain. Yet the impact of pain on healthcare utilization for this population has not been examined. Curtis, Hillis, Kieke, Brett, Marchbanks, & Peterson (1998). Curtis et al. (1998) examined emergency room

visits for gynaecologic disorders in the USA between 1992 -1994. Specifically looking at women of reproductive age, they found approximately half of the 1.4 million annual visits were associated with genital tract infections; however there was no specific analysis of pain. Schwarz et al's (2005) population survey of 2186 women in Germany found that healthcare utilization for gynaecological patients resulted in an average of 2 visits per year, but the study's authors did not review pain specific healthcare utilization.

Pain is recognized to be a contributing factor in increased healthcare utilization, and a result of increased healthcare utilization is escalation of healthcare expenditure (Kjerulff, Frick, Rhoades & Hollenbeak, 2007). In 2007, Kjerulff et al's 3 year study described conditions specific to women and the ensuing healthcare utilization. One fifth of women sought healthcare for female specific conditions during a single year with gynaecological disorders being most commonly experienced by 7% of women requiring healthcare. The study described the increase in healthcare expenditure but did not comment on pain specific healthcare utilization.

Zondervan et al. (2001), in a prevalence study of 2016 women, found that 59% of women who experienced pelvic pain sought medical treatment for their symptoms. Also, Grace and Zondervan (2004) identified that 36% of women who had recently sought healthcare experienced pain for longer periods compared to non-consulters and had more frequent episodes of pain in the previous 12 months. However, both of these surveys were of the general population and were not specific to women waiting for gynaecological surgery.

Purpose of the Study

Much of Canada is meeting the priority 4 target, established by the Ontario Ministry of Health and Long Term Care, that patients wait no more than 182 days for surgery. Available waiting time data however do not provide healthcare professionals with an understanding of patients' symptoms whilst waiting for surgery and the impact of these symptoms upon healthcare utilization. Further research is needed to better understand women's health issues and subsequent healthcare utilization with the aim of improving health promotion and preventative health care (Kazanjian, Morettin & Cho, 2004). The purpose of this study is therefore to describe the characteristics, symptoms and healthcare utilization of women on a waiting list for gynaecological surgery in a tertiary care centre in southeastern Ontario.

Research Objectives

- 1) Describe the symptoms experienced by women waiting for gynaecological surgery.
- 2) Describe the association between psychological symptoms and pain intensity and pain interference.
- 3) Describe the healthcare utilization because of pain by women waiting for gynaecological surgery.
- 4) Explore the relationship between symptoms and healthcare utilization because of pain in women waiting for gynaecological surgery.

Healthcare professionals would benefit from an improved understanding of the type and impact of the unpleasant symptoms on the waiting experience. Within the

primary care setting this knowledge could then benefit patients through provision of focused support and information to improve patient satisfaction despite extended waiting times.

Chapter 3

Manuscript A - Prepared for submission to the Journal of Pain

The Association between Psychological Characteristics and Pain in Women Waiting for
Gynaecological Surgery

Sarah Walker, RGN, RN, BSc (Hons); Wilma M. Hopman, BAH, MA; Margaret B.
Harrison, RN, PhD; Elizabeth G. VanDenKerkhof RN, DrPH

Send all correspondence to:

Elizabeth G. VanDenKerkhof

Dept of Anesthesiology

Kingston General Hospital

76 Stuart St.

Kingston, Ontario, Canada K7L 2V7

613-549-6666, x3964

FAX: 613-548-1375

Email: ev5@queensu.ca

Copyright ©Sarah Walker, September 2009

Abstract

Background: Pain prior to surgical management is frequently a problem for women with gynaecological conditions. Psychological factors also influence an individual's experience of pain. Minimal research was found that examined pain and psychological symptoms in this population. **Objective:** The primary objective was to examine levels of pain intensity and pain interference in women awaiting gynaecological surgery, and secondarily to examine psychological factors associated with pain, specifically anxiety, depression, somatization and catastrophizing. **Method:** Participants included 429 women in a tertiary care centre in southeastern Ontario. Anxiety was measured using the State Trait Anxiety Inventory (STAI), depression with the Centre for Epidemiologic Studies Depression Scale (CES-D), somatization using the Seven Symptom Screening Test (SSST) and catastrophizing was measured using an abbreviated coping strategies questionnaire (CSQ). Pain was assessed using the Brief Pain Inventory (BPI). **Results:** 18.0% of women had a high anxiety score, 37.1% demonstrated a risk of depression needing treatment, 46.6% of women had ≥ 2 symptoms of somatization and 40.1% of women were high catastrophizers. A moderate to severe pain intensity score occurred in 30.5% of participants and 31.5% had a moderate to severe pain interference score. Of the women that experienced pain in the last week, 81.4% believed their pain was due to their primary condition. In multivariable analysis, depression, somatization and catastrophizing were all associated with elevated levels of pain intensity and interference; younger age was associated with interference but not intensity. **Conclusion:** This study supports the need for appropriate preoperative assessment of physical and

Waiting for Surgery: Pain & Psychological Symptoms

psychological symptoms that present while waiting for surgery. This assessment will benefit the patient through reducing complications and improve patient outcomes.

Introduction

Gynaecological conditions cause unpleasant symptoms for women, and pain is frequently a significant component of these symptoms (Stovall, Ling & Crawford 1990; Weber, Walters, Schover, Church & Piedmonte, 1999; Kain, Sevarino, Alexander, Pincus, and Mayes, 2001; Zondervan et al., 2001; Grace & Zondervan, 2004; Hartmann, Lamvu, Langenberg, Steege, Kjerulff 2004; Latthe, Latthe, Say, Gulmezoglu, & Khan, 2006). Types of pain include dysmenorrhoea, premenstrual pain, ovulatory pain and other cyclic pain which may develop into chronic pelvic pain (Martin, 2006). Recognition of the importance of pain management and patient rights to pain treatment have been established within the Canadian Pain Coalition Charter (2003) and the Joint Commission for Accreditation of Healthcare Organization (JCAHO) standards (2001), whose aim is to promote pain management by healthcare professionals.

Not only physical, but psychological, social and cultural factors are increasingly recognized to have an influence on pain. This has become more evident as researchers have combined both the biomedical and psychosocial perspectives in an attempt to understand patients' pain experiences (Turk & Okifuji, 2002; Andrasik, Turk & Flor, 2005; Gatchel & Theodore, 2008). This perspective is reflected in The International Association for the Study of Pain (IASP) definition of pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage". The definition further describes pain as "an unpleasant feeling in a part or parts of the body that is therefore also an emotional experience" (IASP, 2007).

Although healthcare professionals' understanding of pain continues to advance (Goodman, 2003; Holtan & Kongsgaard, 2009), only a few studies have looked at pain

with gynaecological conditions before surgery and these studies were predominantly carried out to examine postoperative outcomes. A few prospective cohort studies have evaluated women prior to gynaecological surgery and found that a significant number suffered from pain prior to hysterectomy (Hartman et al., 2004, Rannestad, Eikeland, Helland, & Qvarnstrom, 2001; Stovall et al., 1990). The impact of psychological factors, in particular depression and anxiety, in women with gynaecological conditions is also documented in the literature (Hartmann et al., Thornton, McQueen, Rosser, Kneale & Dixon, 1997; Carr, Brockbank, Allen & Strike, 2006).

The relationship between psychological factors and pain has also been recognized. For instance, a European literature review by Garcia-Cebrian, Gandhi, Demyttenaere and Peveler (2006) found pain was associated with depressive symptoms in 46 of the 70 papers studied. However, only a small amount of research was found examining gynaecological patients' psychological characteristics in combination with pain. Ell, Sanchez, Vourlekis, Lee, Dwight-Johnson, Lagomasino, Muderspach, and Russell (2005) found anxiety and pain were correlated with depression in a study of 472 women undergoing treatment for breast and gynaecological cancers. Kain et al. (2001) examined 53 women in a prospective cohort study and found those with preoperative anxiety had higher postoperative anxiety and pain, and Hartman et al. (2004) found 13.1% of women prior to hysterectomy had depression and pain.

In addition to anxiety and depression, psychological conditions include somatization and pain catastrophizing. In patients where physical symptoms exist but cannot be medically explained, such characteristics would be classified as somatization disorders, and patients who felt unable to deal with their pain may suffer from a condition

known as catastrophizing. There is evidence in the literature that suggests these preoperative symptoms are associated with pain (Lipowski, 1988; Sharpe & Mayou, 2004; Mai, 2004; Rubin, 2005). However, no studies were found that examined the prevalence of somatization and catastrophizing symptoms in women awaiting gynaecological surgery.

The purpose of this study is to increase the understanding of pain and psychological symptoms in women waiting for gynaecological surgery.

Methods

The primary objective is to examine levels of pain intensity and pain interference in gynaecological patients waiting for surgery and the secondary objective is to examine psychological factors associated with pain, specifically anxiety, depression, somatization and catastrophizing.

Study Design

This was a single centre cross sectional study of women waiting for gynaecological surgery. Data for this study were collected as part of a larger prospective study on the development of chronic post surgical pain in women undergoing gynaecological procedures. Recruitment occurred and consent was obtained at the time of admission for surgery. The women were asked to report on recent physical and psychological symptoms. Ethics approval was obtained from the Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board. The convenience sample was drawn from the waiting list of women at Kingston General Hospital, a tertiary care facility in southeastern Ontario, which serves more than 500,000 people in the local and surrounding community (KGH, 2009).

Inclusion/Exclusion criteria

All participants were English-speaking women aged 18 years or older waiting to undergo gynaecological surgery. Patients were excluded if they were diagnosed with Alzheimer's disease or another form of cognitive impairment.

Conceptual Framework

The Theory of Unpleasant Symptoms was selected to guide the methodology for this study. The theory illustrates the interplay between situational, psychological and physiological factors and their effect on the experience of symptoms (Lenz, Pugh, Milligan, Gift, & Suppe, 1997). In the adapted conceptual framework, being on a waiting list for surgery is the situational factor, psychological aspects to be examined include depression, anxiety, somatizing and catastrophizing, the diagnosis of a gynaecological condition is the physiological factor and the unpleasant symptom to be reviewed is pain, measured through intensity and interference. As well as pain being affected by the situational, psychological and physiological factors, pain may have a feedback effect on these characteristics.

Measures

The independent variables for this analysis were situational (waiting time), psychological (depression, anxiety, somatization and catastrophizing), and physiological (gynaecological factors). As pain is frequently a feature with gynaecological conditions, the primary dependent variables for this study were pain intensity and pain interference. Covariates include demographic, surgical and gynaecological information.

Measurement Tools

The data collection comprised of 5 questionnaires gathering information from patients self-reporting of subjectively perceived pain and psychological factors.

Additional data on smoking status, body mass index (BMI) and registration with a family practitioner were gathered from reviewing patient chart data.

Situational

The women enrolled in this study all had a period of waiting time for surgery and these data were collected from the hospital “wait 2” data (Wait Time Strategy, 2008).

“Wait 2” is defined as the time between the decision to treat and the date of surgery. For this analysis, the “adjusted days waiting” was used, as it adjusts for time that the patients were not available for surgery and therefore more accurately reflects the actual waiting time.

Psychological

Anxiety

Anxiety is an experience which can be caused by social, economic, psychological or physical stressors. The World Health Organization (WHO) describes anxiety in terms of feelings of impending doom, restlessness, and inability to concentrate, make decisions, carry out work, eat or sleep (WHO, 2001). Measurement of anxiety utilized the State Trait Anxiety Inventory (STAI) a self-report measurement tool of 20 questions asking about general feelings (trait anxiety). Scores range from 20-80, with a higher score indicating a greater degree of anxiety. Validity and reliability were demonstrated by Ray (1984) with a Cronbach alpha of 0.84 and 0.91 in the general population. The STAI was used by Carr et al. (2006) to examine anxiety in women prior to and following

gynaecological surgery and by Oudhoff, Timmermans, Knol, Bijnen and van der Wal (2007), to examine patients waiting for surgery. For this study, participants were categorized based on the trait anxiety score <45 (low anxiety), or ≥ 45 which was indicative of a high anxiety score (Carr et al., 2006).

Depression

Depression, as defined by the WHO, is “a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy and poor concentration” (WHO, 2008). Depression was measured using the Centre for Epidemiologic Studies Depression Scale (CES-D), which was designed to study depression in the general population using previously validated depression scales such as the Beck and Zung scales (Radloff, 1977). Shrout and Yager (1989) recognized the CES-D Chronbach alpha of 0.84 and 0.91 in patient groups, signifying reliability. The CES-D, a 20 item questionnaire, involves self-reporting of feelings during the past week. Scores range from 0 to 60 points, with a higher score indicating a greater degree of depression. Magni, Moreschi, Rigatti-Luchini and Merskey used the CES-D in a study about depression and chronic musculoskeletal pain (1994). For this study participant categories were based on a CES-D score of <16 (low depression), or ≥ 16 or more (high depression), which indicates a greater number of depressive symptoms and suggests a risk of depression that requires treatment (Radloff, 1977; Beekman et al., 1997).

Somatization

It is recognized that physical symptoms can be influenced or even stem from emotional problems. In 1980 the Diagnostic and Statistical Manual of Mental Disorders

(DSM-III) grouped such conditions under the name somatoform disorders, where the term identifies the bodily (somatic) component of the conditions (Morrison, 1995). The experiences of such symptoms are real and cause anxiety to the patient. Somatization was originally linked to the term hysteria, as explained by De Gucht and Fischler (2002) and is characterized where physical symptoms are experienced, but there is no identifiable medical cause.

A definitive diagnosis of somatization requires a thorough medical assessment. However self-report questionnaires have been used to provisionally evaluate patients. The DSM-III (1980) measured somatization disorder utilizing a 37 symptom assessment tool, from which a diagnosis required 13 of the symptoms to be experienced starting before the age of 30 (De Gucht & Fishler, 2002). The DSM-IV (1995) condensed the 37 item tool further and the current criteria identify a minimum of 8 symptoms to be experienced, with pain in 4 or more areas of the body recognized as part of the criteria. In an attempt to reduce the lengthy DSM-III 37 symptom assessment process, Othmer and DeSouza in 1985 developed the shortened seven symptom screening test (SSST). In a clinical setting, the tool suggests somatization may exist if 2 of the 7 symptoms are found to be present. The authors acknowledge that although suggestive of a positive result, further medical examination of these patients is required.

Utilizing the validated SSST, this study scored participants according to whether they have <2 (low somatization) or ≥ 2 (high somatization) symptoms present, which is non-indicative or indicative of somatization disorder respectively (Othmer & DeSouza, 1985).

Catastrophizing

Catastrophizing is recognized to be the presence of exaggerated negative self-statements or feelings, and ideation (Rosenstiel & Keefe, 1983). How an individual copes with pain has been measured in numerous studies using Rosenstiel and Keefe's coping strategies questionnaire (Sullivan & D'Eon 1990; Stewart, Harvey & Evans, 2001; Turner, Jensen, Warms & Cardenas, 2002). Within this tool one of the cognitive coping strategies is catastrophizing. Following examination of the coping strategies questionnaire an abbreviated assessment tool was created by Jensen, Keefe, Lefebvre, Romano and Turner (2003). The 2 question tool asks about an individual's feelings when they have pain. The questions were found to be a valid and reliable compact assessment tool for catastrophizing and were added to the pre-surgical healthcare utilization questionnaire. The score was calculated by averaging the answers to the 2 questions and the median split was calculated to create the categorical variables, <2 (low catastrophizing) and ≥ 2 (high catastrophizing).

Physiological Factors

Gynaecological Variables

Self-reported menstrual status was classified into no longer menstruated due to natural or surgical means, or not stopped/unsure. An assumption was made that if they were unsure about their periods stopping, some recent bleeding had probably occurred, and these women were assigned to the periods not stopped category. Data regarding hormone replacement therapy (HRT) and oral contraceptives were collected as possible factors related to hormones and the pain experience; in each case the participants were grouped according to whether they were taking the prescription or not. Lastly, the self-

reported preoperative malignancy status was identified as possibly malignant/malignant or not malignant.

Demographic and Clinical Covariates

Age was categorized according to the documented menopausal range of 45-55 years (Northrup, 2006) (p 559), creating the groups of premenopausal (18-44 years), menopausal (45-55 years) and postmenopausal (≥ 56 years). Marital status was categorized as married or not married. Due to the small size of some of the racial categories the variable of racial heritage was divided into Caucasian and non-Caucasian groups. Education was classified into two groups including no diploma/high school diploma versus trade or professional school certificate/diploma/some university/postgraduate degree(s). Part-time and full time employed participants were combined into the employed category; the remaining participants, not employed, retired, homemaker and other were classified together. BMI, an established measure for identifying if a person is overweight or obese, was categorized according to the WHO classification (2006), with the ranges of underweight/normal weight ≤ 24.9 kg/m²; overweight 25-29.9 kg/m² and obese ≥ 30 kg/m². The underweight and normal categories were combined due to the small number of participants in the underweight, < 18.5 kg/m², range. Participants were classified by current smoking status and finally, patients were grouped according to whether or not they had undergone previous abdominal surgery.

Physical Symptom- Primary Outcome

Pain

The main outcomes for this study were pain intensity and pain interference scores. The Brief Pain Inventory Long Form (BPI-LF), a multidimensional assessment

instrument, developed from the Wisconsin Brief Pain Inventory measures the severity of pain and the impact of pain on daily function (Daut, Cleeland, & Flanery, 1983).

Participants rate the intensity of their pain ‘over the past week’ and ‘right now’. The rating of intensity was on a numerical scale of 0 (no pain) to 10 (pain as bad as you can imagine). Pain interference is rated with activities during the past week between 0 (does not interfere) and 10 (completely interferes). Scoring of both the intensity and interference of pain is carried out independently. Validity and reliability were assessed by Tan, Jensen, Thornby and Shanti (2004) with the Cronbach alpha of 0.85 for intensity of pain and 0.88 for pain interference. For the purpose of this study, pain intensity and pain interference summary scores were dichotomized into none/mild ($\leq 3/10$) and moderate/severe ($>3/10$).

Statistical Analysis

Data analysis was carried out using the SPSS software version 16.0. Given the descriptive nature of this study a sample size calculation was not conducted. Descriptive statistics were calculated using frequency and percentages for categorical variables and means, standard deviation, range and interquartile range for continuous variables.

Bivariate analysis was conducted using the Chi square statistical test to assess for associations between pain status and the independent variables. If the significance level was $p=0.1$ or less, variables were included in a logistic regression analysis. The results are presented with the odds ratio (O.R.) and confidence intervals (C.I.) for both bivariate and multivariable analyses. The level of significance was set at .05.

Results

Of the 635 women approached and invited to join the study, 441 were recruited, and 6 withdrew before completing the questionnaires, leaving 435 patients with complete data. A review of the data set identified 6 participants who had undergone urological surgery. Due to the small sample size of urological patients they were not included in the study, leaving 429 participants waiting for gynaecological surgery. The predominant surgical procedure was hysterectomy (77.2%), and a variety of other surgeries were included, such as ovarian or tubal procedures (12.1%), exploratory/peritoneal procedures (3.5%), pelvic floor repair (2.8%) and other gynaecological procedures (5.4%). Table 3.1 presents situational, psychological, physiological and demographic variables collected for each participant. The age ranged from 18-83 years with mean of 48.3 and a standard deviation (SD) of 11 years. Predominantly Caucasian (93.2%), 68.8% had previous abdominal surgery, 40.3% were no longer menstruating and of these, 10.5% had stopped due to surgical means. Thirty nine point nine percent of participants' had a possibly malignant or malignant etiology.

Psychological Factors

The mean trait anxiety score was 34.2 out of a possible range 20-80, and 18.0% of women had a high anxiety score (≥ 45). The mean depression score was 13.8 and a high depression score (≥ 16) occurred in 37.1% of participants. Somatization scores ranged between 0-6, the mean was 1.6 and 46.6% of women had a high somatization score (≥ 2) (see Table 3.1 for frequency of somatization scores). Catastrophizing scores ranged from 0-6, the mean score was 1.7, and 40.1% of participants had a high catastrophizing score of 2.0 or more.

Pain

Table 3.2 a and b shows pain intensity and pain interference results. Of the 429 women, 226 reported pain in the past week. Patients with no pain accounted for 47%. On average the median pain intensity score was 4.0 (IQR 3.0-6.0). A pain intensity of $>3/10$ occurred in 30.5% of participants. For the women with pain during the past week, pain interference scores are also presented. Total median interference score was 4.0 (IQR 2.0-6.0) and 31.5% had a pain interference score $>3/10$. No pain interference occurred in 49% participants. Of the women that experienced pain in the last week, 81.4% believed their pain was due to their primary gynaecological condition.

Pain Descriptors

Data obtained from the BPI also provided a list of words used by women when asked to describe their pain. Figure 3.1 shows the most common words used by women to describe their pain. Seventy five percent of the women with pain described it as aching, tiring, nagging, tender and miserable. The number of pain descriptors used by each participant was also obtained from the BPI-LF as shown in Figure 3.2, with nearly half the participants selecting 8 words or more to describe their pain.

Relationship between Psychological Factors and Pain.

In bivariate analysis anxiety, depression, somatization and catastrophizing were associated with pain intensity ($p<0.001$) (Table 3.3). Anxiety, depression, somatization and catastrophizing and age were associated with pain interference ($p<0.001$) (Table 3.4).

In multivariable analysis depression (O.R. 2.0, 95% C.I. 1.2, 3.3), somatization (O.R. 2.8, 95% C.I. 1.7, 4.5), and catastrophizing (O.R. 4.0, 95% C.I. 2.5-6.6) were associated with moderate to severe pain intensity (Table 3.3). Depression (O.R.3.0, 95%

C.I. 1.8, 4.8), somatization (O.R. 2.2, 95% C.I. 1.3, 3.4), catastrophizing (O.R. 2.4, 95% C.I. 1.5, 3.9) and younger age (O.R. 2.4, 95% C.I. 1.2, 4.6), were associated with moderate to severe pain interference (Table 3.4).

Discussion

The overall aim of this study was to increase understanding of psychological symptoms and pain in women waiting for gynaecological surgery. Moderate to severe levels of pain intensity and interference were found to occur in one-third of the population, and the younger age group reported higher pain interference. Participants with higher levels of depression, somatization and catastrophizing all demonstrated higher pain intensity and pain interference.

Psychological Factors

Levels of depressive symptoms found in our study are consistent with the literature. Thornton et al. (1997), although not exploring pain, examined levels of depression using the hospital anxiety and depression scale in women prior to hysterectomies, found 26% of the population had clinically significant levels of depression. Our results support the link between depression and pain in gynaecological patients, found in a previous study by Hartmann et al. (2004) where physical function and elevated pain were most affected in the participants with pain and depression. These results further encourage healthcare practitioners to consider depression and pain in gynaecological patients to ensure adequate assessment and appropriate treatment is provided prior to surgery.

Patients with unexplained medical symptoms are classified as having functional somatic distress (Kirmayer & Robbins, 1991). Although no previous research was found

in the gynaecological population, our findings show patients who somatize are more likely to have elevated pain scores (45.5%). In addition to links with pain, somatization has also been associated with increased anxiety and depression (Kirmayer & Robbins) and greater healthcare utilization (Barsky et al., 2006). Therefore our results support the need for healthcare practitioners to better understand somatization which has the potential for influencing patients' preoperative presentation. Early recognition of patients who somatize will enable appropriate treatment such as cognitive-behavioural approaches to be implemented (Barsky et al.).

This study has provided evidence of catastrophizing and the link to elevated pain in gynaecological patients prior to surgery. Similarly, Turner et al. (2002) examined spinal cord injury patients using the coping strategies questionnaire; they also found catastrophizing to be statistically correlated to pain intensity and pain interference. Identification of patients who catastrophize will help healthcare professionals to understand how patients cope with their pain (Sullivan, Tripp & Santor, 2000) and reinforces the need for biopsychosocial approach to pain management. Furthermore, a benefit of understanding which patients catastrophize is to better predict and control the level of healthcare use by these individuals (Martorella, Cote & Choiniere, 2008).

Demographic Covariates

Younger women reported higher pain interference in our study. A similar result was found by Blyth et al. (2001) whose study examined prevalence of chronic pain in Australian adults, and found greatest levels of pain interference in the youngest age group, although no indication of pain location was recorded. Conceptually, this result could be expected if the youngest age-group were involved in more activities, increasing

the likelihood of pain resulting in interference. Alternatively, younger women may have experienced their gynaecological condition for a shorter time and could have adapted less than older women who no longer interpret their pain as causing interference. These are only postulations and would require further investigation. Regardless of age, healthcare practitioners need to be aware of the impact of pain upon patients' activity levels and the potential for interference.

Physical Symptom

Pain

A significant result from this study is that a moderate to severe pain intensity of $>3/10$ occurred in 30.5% of participants. The level of interference for pain was also significant for a number of women as a moderate to severe pain interference of $>3/10$ occurred in 31.5% of women. Our results support evidence from other studies such as Hartman et al's (2004) large prospective study of 1249 gynaecological patients where 17.1% of women identified moderate, severe or very severe pain, in addition to a further 11.7% of women with depression and pain in their preoperative assessment. Further studies were found to identify preoperative pain in gynaecological patients but they did not determine the pain intensity or interference scores (Rannestad et al., 2001; Stovall et al., 1990). Additional studies were found that utilized the BPI to examine pain interference, however they focused on postoperative pain scores and therefore results cannot be directly compared with our study (Carr, Nicky Thomas, & Wilson-Barnet, 2005; Lin & Wang, 2004). Gynaecological pain prior to surgery has a significant impact on patients and our results therefore suggest that healthcare professionals need to ensure adequate pain management protocols for patients prior to surgery.

Pain Descriptors

The use of the term aching was the most frequent descriptive word for pain, used by 80% of the participants in this study. This was similar to Holtan and Kongsgaard's result (2009); however they studied cancer pain patients therefore results cannot be compared with this study as not all women had a malignant etiology.

Study Limitations

A study limitation was the use of self-reported questionnaires, with no additional methods to corroborate information; however the prevalence of pain and pain characteristics all correlated with other studies within the literature. Another limitation was the use of cross sectional data, therefore the direction of the causal link is not known, i.e. did higher levels of pain intensity or pain interference result from the individual psychological factors or did the high pain intensity and pain interference cause the psychological factors to be higher? Despite this uncertainty, it is apparent that both physical and psychological factors exist and healthcare practitioners need to be cognizant of the potential influence of these on patients prior to surgery. It was also unknown to what extent the women who declined to join the study suffered from physical and psychological characteristics and whether the women that enrolled were more interested because of a personal experience with pain. On the contrary, women with high levels of pain may not have felt well enough to complete the questionnaires prior to surgery. Therefore it is not known how this bias might affect the study. However, this study included a substantial population and a significant number of these women reported no pain intensity in the past week and 53% of the population reported experiencing pain. A prevalence study of pain carried out in the same locality of southeastern Ontario found

49% of the population reported chronic pain and 60% of the population experienced pain from a low to high degree (Tripp, VanDenKerkhof & McAlister, 2006) which is similar to our result and therefore increases the likelihood that our study is representative of the preoperative gynaecological population.

Study Attributes/Strengths

A review of the data highlighted that very few questions were unanswered by participants, therefore minimal missing data for the sample size increases the validity of the data collected. The sample size of 429 participants was sufficient to allow several variables to be included in the analysis and increased the probability of the sample being representative of gynaecological patients waiting for surgery. Furthermore the comprehensive data collected, allowing a variety of situational, psychological, physiological and demographic factors to be examined for each patient, were then controlled for within the statistical analysis and the significant variables were then highlighted. Reporting of gynaecological, physical and psychological symptoms were all measured within a short time period, therefore diminishing the chance of recall bias. The participants in this study consisted of a homogeneous population, with all women waiting to undergo gynaecological surgery. Having a population with similar characteristics will lower the variability of reporting which could occur in groups with different demographics.

Implications for Healthcare Professionals

The results from this study increase awareness of the needs of gynaecological patients prior to surgery. In addition to the physical symptoms, women can also suffer from psychological stressors, which if prolonged may have a detrimental impact on their

health through increased levels of depression, somatization and catastrophizing. Specifically, there is a better understanding of psychological factors and their correlation with increased levels of pain intensity and pain interference. This study supports the need for appropriate preoperative assessment of physical and psychological symptoms that present while waiting for surgery. This will benefit the patient through reducing complications and help improve patient outcomes.

Summary

Increased evidence of psychological factors and their association with pain intensity and pain interference are provided by this study. Such information helps to highlight potential needs in patients prior to surgery. This information will help healthcare professionals understand patient characteristics that impact pain and reinforce the need for biopsychosocial approach to pain management when providing preoperative care. Future research should examine interventions in the preoperative healthcare setting designed to target pain management and provide psychological support prior to surgery.

References

- Barsky, A. J., Orav, E. J., & Bates, D. W. (2006). Distinctive patterns of medical care utilization in patients who somatize. *Medical Care, 44*(9), 803-811.
- Beekman, A. T., Deeg, D. J., Van Limbeek, J., Braam, A. W., De Vries, M. Z., & Van Tilburg, W. (1997). Criterion validity of the center for epidemiologic studies depression scale (CES-D): Results from a community-based sample of older subjects in the netherlands. *Psychological Medicine, 27*(1), 231-235.
- Blyth, F. M., March, L. M., Brnabic, A. J., Jorm, L. R., Williamson, M., & Cousins, M. J. (2001). Chronic pain in australia: A prevalence study. *Pain, 89*(2-3), 127-134.
- Canadian Pain Consortium (2001). Canadian Consortium on Pain Mechanism Diagnosis and Management. <http://www.curepain.ca/final.htm> Last retrieved November 2nd 2006. Unable to access link August 25th 2009.
- Carr, E., Brockbank, K., Allen, S., & Strike, P. (2006). Patterns and frequency of anxiety in women undergoing gynaecological surgery. *Journal of Clinical Nursing, 15*(3), 341-352.
- Carr, E. C., Nicky Thomas, V., & Wilson-Barnet, J. (2005). Patient experiences of anxiety, depression and acute pain after surgery: A longitudinal perspective. *International Journal of Nursing Studies, 42*(5), 521-530.

- Daut, R. L., Cleeland, C. S., & Flanery, R. C. (1983). Development of the wisconsin brief pain questionnaire to assess pain in cancer and other diseases. *Pain, 17*(2), 197-210.
- De Gucht, V., & Fischler, B. (2002). Somatization: A critical review of conceptual and methodological issues. *Psychosomatics: Journal of Consultation Liaison Psychiatry, 43*(1), 1-9.
- Ell, K., Sanchez, K., Vourlekis, B., Lee, P. J., Dwight-Johnson, M., Lagomasino, I., et al. (2005). Depression, correlates of depression, and receipt of depression care among low-income women with breast or gynecologic cancer. *Journal of Clinical Oncology, 23*(13), 3052-3060.
- Garcia-Cebrian, A., Gandhi, P., Demyttenaere, K., & Peveler, R. (2006). The association of depression and painful physical symptoms--a review of the european literature. *European Psychiatry: The Journal of the Association of European Psychiatrists, 21*(6), 379-388.
- Gatchel, R. J., & Theodore, B. R. (2008). Evidence-based outcomes in pain research and clinical practice. *Pain Practice, 8*(6), 452-460.
- Goodman, G.R. (2003) Outcomes measurement in pain management issues of disease complexity and uncertain outcomes. *Journal of Nursing Care Quality* 18 (2), 105-111.

- Grace, V. M., & Zondervan, K. T. (2004). Chronic pelvic pain in new zealand: Prevalence, pain severity, diagnoses and use of the health services. *Australian & New Zealand Journal of Public Health*, 28(4), 369-375.
- Hartmann, K. E., Ma, C., Lamvu, G. M., Langenberg, P. W., Steege, J. F., & Kjerulff, K. H. (2004). Quality of life and sexual function after hysterectomy in women with preoperative pain and depression. *Obstetrics & Gynecology*, 104(4), 701-709.
- Hilkhuisen, G. L., Oudhoff, J. P., Rietberg, M., van der Wal, G., & Timmermans, D. R. (2005). Waiting for elective surgery: A qualitative analysis and conceptual framework of the consequences of delay. *Public Health*, 119(4), 290-293.
- Holtan, A., & Kongsgaard U.E. (2009) The use of pain descriptors in cancer patients. *Journal of Pain and Symptom Management*, 38 (2), 208-215.
- International Association for the study of Pain (IASP) (2007) Retrieved September 18th 2009 from http://www.iasp-pain.org/AM/Template.cfm?Section=Pain_Definitions&Template=/CM/HTMLDisplay.cfm&ContentID=1728
- Jensen, M. P., Keefe, F. J., Lefebvre, J. C., Romano, J. M., & Turner, J. A. (2003). One and two-item measures of pain beliefs and coping strategies. *Pain*, 104(3), 453-469.
- Joint Commission for Accreditation of Healthcare Organization (JCAHO) standards (2001). Retrieved August 25th 2009 from http://www.jointcommission.org/NewsRoom/health_care_issues.htm

- Kain, Z. N., Sevarino, F., Alexander, G. M., Pincus, S., & Mayes, L. C. (2000). Preoperative anxiety and postoperative pain in women undergoing hysterectomy. A repeated-measures design. *Journal of Psychosomatic Research*, 49(6), 417-422.
- KGH (2009) Kingston General Hospital Website Retrieved August 25th from <http://www.kgh.on.ca/about/about.asp>
- Kirmayer, L. J., & Robbins, J. M. (1991). Three forms of somatization in primary care: Prevalence, co-occurrence, and sociodemographic characteristics. *Journal of Nervous & Mental Disease*, 179(11), 647-655.
- Lathe, P., Lathe, M., Say, L., Gulmezoglu, M., & Khan, K. S. (2006). WHO systematic review of prevalence of chronic pelvic pain: A neglected reproductive health morbidity. *BMC Public Health*, 6, 177.
- Lenz, E. R., Pugh, L. C., Milligan, R. A., Gift, A., & Suppe, F. (1997). The middle-range theory of unpleasant symptoms: An update. *Advances in Nursing Science*, 19(3), 14-27.
- Lin, L. Y., & Wang, R. H. (2005). Abdominal surgery, pain and anxiety: Preoperative nursing intervention. *Journal of Advanced Nursing*, 51(3), 252-260.
- Lipowski, Z. J. (1988). Somatization: The concept and its clinical application. *American Journal of Psychiatry*, 145(11), 1358-1368.
- Mai, F. (2004). Somatization disorder: A practical review. [see comment]. *Canadian Journal of Psychiatry - Revue Canadienne De Psychiatrie*, 49(10), 652-662.

Martin, D. C. (2006). Hysterectomy for treatment of pain associated with endometriosis.

Journal of Minimally Invasive Gynecology, 13(6), 566-572.

Martorella, G., Cote, J., & Choiniere, M. (2008). Pain catastrophizing: A dimensional

concept analysis. *Journal of Advanced Nursing*, 63(4), 417-426.

Morrison, J. (1995). Somatization disorder 300.81. *DSM-IV made easy - the clinician's*

guide to diagnosis (pp. 294-295). New York: The Guildford Press.

Othmer, E., & DeSouza, C. (1985). A screening test for somatization disorder (hysteria).

American Journal of Psychiatry, 142(10), 1146-1149.

Oudhoff, J. P., Timmermans, D. R., Knol, D. L., Bijnen, A. B., & van der Wal, G. (2007).

Waiting for elective general surgery: Impact on health related quality of life and psychosocial consequences. *BMC Public Health*, 7, 164.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the

general population. *Applied Psychological Measurement*, 1(3), 385-401.

Rannestad, T., Eikeland, O., Helland, H., & Qvarnstrom, U. (2001). Are the

physiologically and psychosocially based symptoms in women suffering from gynecological disorders alleviated by means of hysterectomy? *Journal of Women's Health & Gender-Based Medicine*, 10(6), 579-587.

Ray, J. J. (1984). Measuring trait anxiety in general population samples. *Journal of Social*

Psychology, 123(2D Half), 189-193.

- Rosenstiel, A. K., & Keefe, F. J. (1983). The use of coping strategies in chronic low back pain patients: Relationship to patient characteristics and current adjustment. *Pain, 17*(1), 33-44.
- Shrout, P. E., & Yager, T. J. (1989). Reliability and validity of screening scales: Effect of reducing scale length. *Journal of Clinical Epidemiology, 42*(1), 69-78.
- Stewart, M. W., Harvey, S. T., & Evans, I. M. (2001). Coping and catastrophizing in chronic pain: A psychometric analysis and comparison of two measures. *Journal of Clinical Psychology, 57*(1), 131-138.
- Stovall, T. G., Ling, F. W., & Crawford, D. A. (1990). Hysterectomy for chronic pelvic pain of presumed uterine etiology. *Obstetrics & Gynecology, 75*(4), 676-679.
- Sullivan, M.J.L., Tripp, D.A. & Santor, D. (2000) Gender differences in pain and pain behavior: the role of catastrophizing. *Cognitive Therapy and Research 24* (1), 121-134.
- Sullivan, M. J., & D'Eon, J. L. (1990). Relation between catastrophizing and depression in chronic pain patients. *Journal of Abnormal Psychology, 99*(3), 260-263.
- Tan, G., Jensen, M. P., Thornby, J. I., & Shanti, B. F. (2004). Validation of the brief pain inventory for chronic nonmalignant pain. *Journal of Pain, 5*(2), 133-137.
- Thornton, E. W., McQueen, C., Rosser, R., Kneale, T., & Dixon, K. (1997). A prospective study of changes in negative mood states of women undergoing

surgical hysterectomy: The relationship to cognitive predisposition and familial support. *Journal of Psychosomatic Obstetrics & Gynecology*, 18(1), 22-30.

Tripp, D. A., VanDenKerkhof, E. G., & McAlister, M. (2006). Prevalence and determinants of pain and pain-related disability in urban and rural settings in southeastern ontario. *Pain Research & Management*, 11(4), 225-233.

Turk, D.C., & Okifuji, A. (2002). Psychological factors in chronic pain: evolution and revolution. *Journal of Consulting and Clinical Psychology*, 70(3), 678-690.

Turner, J. A., Jensen, M. P., Warm, C. A., & Cardenas, D. D. (2002). Catastrophizing is associated with pain intensity, psychological distress, and pain-related disability among individuals with chronic pain after spinal cord injury. *Pain*, 98(1-2), 127-134.

Wait Time Strategy (2008) Practical Guide for Clinicians – The Tools and Information to Track Wait Times. Version 3.0 and Gynaecological Surgery Practical Guidelines for Clinicians v1.

Weber, A. M., Walters, M. D., Schover, L. R., Church, J. M., & Piedmonte, M. R. (1999). Functional outcomes and satisfaction after abdominal hysterectomy. *American Journal of Obstetrics & Gynecology*, 181(3), 530-535.

World Health organization (WHO) (2001) Anxiety definition. Retrieved August 25th 2009 from <http://www.emro.who.int/MNH/WHO/PublicInformation-Part6.htm>

World Health organization (WHO) Body Mass Index classification (copyright 2006)

http://apps.who.int/bmi/index.jsp?introPage=intro_3.html Retrieved August 25th
2009

World Health organization (WHO) (2008) Depression definition. Retrieved August 25th

2009, from <http://www.who.int/topics/depression/en/>

Zondervan, K. T., Yudkin, P. L., Vessey, M. P., Jenkinson, C. P., Dawes, M. G., Barlow, D. H., et al. (2001). The community prevalence of chronic pelvic pain in women and associated illness behaviour. *British Journal of General Practice*, 51(468), 541-547.

Waiting for Surgery: Pain & Psychological Symptoms

Table 3.1 Baseline Characteristics of Women Waiting for Gynaecological Surgery

		Total n=429	% *
		n	
SITUATIONAL VARIABLES			
Adjusted Days Waited▪	< 4 weeks	111	25.9
	4-8 weeks	149	34.7
	> 8 weeks	169	39.4
PSYCHOLOGICAL VARIABLES			
Trait Anxiety Score▪	Low (<45)	350	82.0
	High (≥45)	77	18.0
CES-D Depression Score②	Low (<16)	270	62.9
	High (≥16)	159	37.1
SSST♦③ Score	0	78	18.2
	1	147	34.3
	2	115	26.8
	3	55	12.8
	4	20	4.7
	≥ 5	10	2.3
Catastrophizing Score	No catastrophizing	128	29.8
	Low catastrophizing	129	30.1
	High catastrophizing	172	40.1
PHYSIOLOGICAL VARIABLES - GYNAECOLOGICAL			
Menstruation	Not stopped	225	52.4
	Unsure /irregular	31	7.2
	Stopped naturally	128	29.8

Waiting for Surgery: Pain & Psychological Symptoms

		Total n=429	% *
		n	
Currently taking			
Hormone	Yes	23	6.8
Replacement	No	316	93.2
Therapy			
Have taken Birth	Yes	40	9.5
Control Pills in the	No	382	90.5
past month [~]			
Preoperative	Possibly malignant	99	23.1
Malignancy Status	Malignant	72	16.8
	Not malignant	256	59.7
DEMOGRAPHIC & CLINICAL VARIABLES			
Age	18-44 years	160	37.3
	45-55 years	168	39.2
	>56 years	101	23.5
Marital Status	Single/Divorced/Widowed	123	28.7
	Married	306	71.3
Racial Heritage [^]	Caucasian	399	93.2
	Non-Caucasian	29	6.8
Highest Education Grade Achieved	No diploma	50	11.7
	High school diploma	87	20.3
	Trade or professional school		
	certificate/diploma	150	35.0
	Some University/Postgraduate degree(s)	142	33.1

Waiting for Surgery: Pain & Psychological Symptoms

		Total n=429	% *
		n	
Employment Status	Unemployed/Retired/Homemaker	111	25.9
	Employed part time or full time	283	66.0
	Other	35	8.2
Body Mass Index (kg/m ²)	≤24.9 Underweight/ Normal	126	29.4
	25-29.9 Overweight	126	29.4
	≥30 Obese	177	41.3
Current Smoker	Yes	90	21.0
	No	339	79.0
Previous Abdominal Surgery	Yes	295	68.8
	No	130	30.3
PHYSICAL VARIABLES			
Pain Intensity (Average score from x4 BPI ⊕ questions)	≤3/10	298	69.5
	>3/10	131	30.5
Pain Interference (Average score from x7 BPI questions)	≤3/10	294	68.5
	>3/10	135	31.5

Waiting for Surgery: Pain & Psychological Symptoms

Continuous Variables	Mean (\bar{x})	Standard Deviation	Range (min/ max)	Interquartile range (25% and 75%)
Age in years	48.3	11.0	18-83	41-54
Body Mass Index	29.1	7.4	17-60	24-33
Trait Anxiety	34.2	10.7	20-72	26-41
CES-D scores ^①	13.8	11.6	0-58	5-20
Waiting Time	63.8	60.6	0-680	27-85

^ 1 participant missing

• 2 participants missing

˘ 7 participants missing

*Values do not always equal 100% due to rounding

① Brief Pain Inventory

② Centre for Epidemiological Studies – Depression

Table 3.2 a- Pain Intensity Scores Obtained from the Brief Pain Inventory for All Participants and Women with Pain.

Pain Intensity Scale 0-10		Total number of women (n=429)			Total number with pain (n=226)		
		n	median	25%, 75%	n	median	25%, 75%
Please rate your pain by circling the one number that best describes your pain at its worst in the past week.		429	2.0	0.0, 7.0	226	6.0	4.0, 8.0
Please rate your pain by circling the one number that best describes your pain at its least in the past week.		429	0.0	0.0, 1.5	142	3.0	1.8, 4.0
Please rate your pain by circling the one number that best describes your pain on the average .		429	1.0	0.0, 5.0	222	4.0	3.0, 6.0
Please rate your pain by circling the one number that tells how much pain you have right now .		429	0.0	0.0, 2.0	157	3.0	2.0, 5.0
Total Score		429	1.0	0.0, 4.0	226	4.75	2.0, 3.0
n (%)	>3/10	298 (69.5)					
	≤3/10	131 (30.5)					

Table 3.2 b Pain Interference Scores Obtained from the Brief Pain Inventory for All Participants and Women with Pain.

Pain Interference Scale 0-10		Total number of women (n=429)			Total number with pain (n=226)		
		n	median	25%, 75%	n	median	25%, 75%
Circle the one number that describes how, during the past week, pain has interfered with your:							
General Activity		429	0.0	0.0, 5.0	198	5.0	3.0, 7.0
Mood		429	0.0	0.0,5.0	187	5.0	3.0, 7.0
Walking Ability		429	0.0	0.0,3.0	153	5.0	3.0, 7.0
Normal Work (includes both work outside the home and housework)		429	0.0	0.0,5.0	188	5.0	3.0, 8.0
Relations with other people		429	0.0	0.0,2.0	136	5.0	2.0, 7.0
Sleep		429	0.0	0.0, 5.0	177	6.0	3.0, 8.0
Enjoyment of life		429	0.0	0.0, 5.0	190	5.0	3.0, 8.0
Total Score		429	0.0	0.0, 4.0	226	4.0	2.0, 6.0
n (%)	>3/10	294 (68.5)					
	≤3/10	135 (31.5)					

Waiting for Surgery: Pain & Psychological Symptoms

Table 3.3 - Bivariate and Multivariable results for Pain Intensity Scores

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Pain Intensity Score $\leq 3/10$ n=298 n (%)*	Pain Intensity Score $> 3 /10$ n=131 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
SITUATIONAL FACTORS							
Adjusted Days Waited•							
< 4 weeks	111	82 (73.9)	29 (26.1)	1.0	-	-	-
4-8 weeks	149	107 (71.8)	42 (28.2)	1.1	0.6, 1.9	-	NA
> 8 weeks	169	109 (64.5)	60 (35.5)	1.5	0.9,2.6	-	NA
PSYCHOLOGICAL FACTORS							
Trait Anxiety score•	350	258 (73.7)	92 (26.3)	1.0	-		
Low (20-44)							
High (≥ 45)	77	39 (50.6)	38 (49.4)	2.7	1.6, 4.5	-	n.s
CES-D ①							
Depression Score							
Low (< 16)	270	217 (80.4)	53(19.6)	1.0	-	-	-
High (≥ 16)	159	81 (50.9)	78 (49.1)	3.9	2.6, 6.1	2.0	1.2, 3.3
SSST ②◆							
Low (< 2)	225	186 (82.7)	39 (17.3)	1.0	-	-	-
High (≥ 2)	200	109 (54.5)	91 (45.5)	4.0	2.6, 6.2	2.8	1.7, 4.5

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Pain Intensity Score $\leq 3/10$ n=298 n (%)*	Pain Intensity Score $> 3/10$ n=131 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Catastrophizing score							
No/Low ($< 2/6$)	257	217 (84.4)	40 (15.6)	1.0	-	-	-
High ($\geq 2/6$)	172	81 (47.1)	91 (52.9)	6.1	3.9, 9.6	4.0	2.5, 6.6
PHYSIOLOGICAL FACTORS - GYNAECOLOGICAL							
Current Menstruation Status							
Periods stopped surgically or naturally	173	126 (72.8)	47 (27.2)	1.0	-	-	-
Periods not stopped or unsure	256	172 (67.2)	84 (32.8)	1.3	0.9, 2.0	-	NA
Currently taking Hormone Replacement Therapy							
Yes	23	16(69.6)	7 (30.4)	1.0	-	-	-
No	316	221 (69.9)	95 (30.1)	1.0	0.4, 2.5	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Pain Intensity Score ≤3/10 n=298 n (%)*	Pain Intensity Score >3 /10 n=131 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Have taken Birth Control Pills in the past month [~]							
Yes	40	28 (70.0)	12 (30.0)	1.0	-	-	-
No	382	265 (69.4)	117 (30.6)	1.0	0.5, 2.1	-	NA
Preoperative malignancy status [▪]							
Possibly malignant or	171	124 (72.5)	47 (27.5)	1.0	-	-	-
Malignant	256	173 (67.6)	83 (32.4)	1.3	0.8, 1.9	-	NA
Not malignant							
DEMOGRAPHIC & CLINICAL COVARIATES							
Age							
≥56 years	101	81 (80.2)	20 (19.8)	1.0	-	-	-
45-55 years	168	119 (70.8)	49 (29.2)	2.6	0.9, 3.0	-	n.s
18-44 years	160	98 (61.2)	62 (38.8)	1.7	1.4, 4.6	-	n.s
Marital Status							
Single/Divorced/ Widowed	123	82 (66.7)	41 (33.3)	1.0	-	-	-
Married	306	216 (70.6)	90 (29.4)	0.8	0.5, 1.3	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable Analysis	
		Pain Intensity Score ≤3/10 n=298 n (%)*	Pain Intensity Score >3 /10 n=131 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Racial Heritage ^							
Caucasian	399	282 (70.7)	117 (29.3)	1.0	-		
Non-Caucasian	29	15 (51.7)	14 (48.3)	2.3	1.1, 4.8	-	n.s
Highest education grade achieved							
≤High school diploma	137	94 (68.6)	43 (31.4)	1.0	-		
> High school diploma	292	204 (69.9)	88 (30.1)	0.9	0.6, 1.5	-	NA
Employment Status							
Not employed/retired /other	146	101 (69.2)	45 (30.8)	1.0	-		
Employed full time or part time	283	197 (69.6)	86 (30.4)	1.0	0.6, 1.5	-	NA
Body Mass Index (kg/m ²)							
≤24.9	126	82 (27.5)	44 (33.6)	1.0	-		
25-29.9	126	87 (29.2)	39 (29.8)	0.8	0.5, 1.5	-	NA
≥30	177	129 (43.3)	48 (36.6)	0.7	0.4,1.1	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Pain Intensity Score ≤3/10 n=298 n (%)*	Pain Intensity Score >3 /10 n=131 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Current Smoker							
Yes	90	62 (79.2)	28(78.6)	1.0	-		
No	339	236 (20.8)	103 (21.4)	1.0	0.6, 1.6	-	NA
Previous Abdominal Surgery							
Yes	295	198 (67.3)	97 (74.0)	1.0	-		
No	130	96 (32.7)	34 (26.0)	0.7	0.5, 1.1	-	NA

^ 1 participant missing
 ◆ 4 participants missing
 ■ 2 participants missing
 ~ 7 participants missing

① Centre for Epidemiological Studies - Depression Scale
 ② Seven Symptoms Screen Test (for somatization)
 *Values do not always equal 100% due to rounding
 n.s- Not significant
 NA- Not Applicable – not significant at bivariate analysis so not included in multivariable analysis

Waiting for Surgery: Pain & Psychological Symptoms

Table 3.4 - Bivariate and Multivariable results for Pain Interference Scores

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Pain Interference Score ≤3/10 n=294 n (%)*	Pain Interference Score >3/10 n=135 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
SITUATIONAL FACTORS							
Adjusted Days Waited [▪]							
< 4 weeks	111	82 (73.9)	29 (26.1)	1.0	-		
4-8 weeks	149	100 (67.1)	49 (32.9)	1.4	0.8, 2.4	-	NA
> 8 weeks	169	112 (66.3)	57 (33.7)	1.4	0.8, 2.4	-	NA
PSYCHOLOGICAL FACTORS							
Trait Anxiety score [▪]							
Low (20-44)	350	254 (72.6)	96 (27.4)	1.0	-		
High (≥45)	77	39 (50.6)	38 (49.4)	2.6	1.6, 4.3	-	n.s
CES-D ⊕ Depression Score							
Low (<16)	270	220 (81.5)	50 (18.5)	1.0	-	-	-
High (≥16)	159	74 (46.5)	85 (53.5)	5.1	3.3, 7.8	3.0	1.8, 4.8
SSST ⊕♦							
Low (< 2)	225	180 (80.0)	45 (20.0)	1.0	-	-	-
High (≥ 2)	200	111 (55.5)	89 (44.5)	3.2	2.1, 4.9	2.2	1.3, 3.4

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable Analysis	
		Pain Interference Score ≤3/10 n=294 n (%)*	Pain Interference Score >3/10 n=135 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Catastrophizing score							
No Low (<2/6)	257	209 (81.3)	48 (18.7)	1.0	-	-	-
High (≥2/6)	172	85 (49.4)	87 (50.6)	4.5	2.9, 6.9	2.4	1.5, 3.9
PHYSIOLOGICAL FACTORS - GYNAECOLOGICAL							
Current Menstruation Status							
Periods stopped surgically or naturally	173	131 (75.7)	42 (24.3)	1.0	-	-	-
Periods not stopped or unsure	256	163 (63.7)	93 (36.3)	1.8	1.2, 2.7	-	n.s
Currently taking Hormone Replacement Therapy							
Yes	23	16 (69.6)	7 (30.4)	1.0	-	-	-
No	316	221 (69.9)	95 (30.1)	1.0	0.4, 2.5	-	NA
Have taken Birth Control Pills in the past month [~]							
Yes	40	30 (75.0)	10 (25.0)	1.0	-	-	-
No	382	258 (67.5)	124 (32.5)	1.4	0.7, 3.0	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Pain Interference Score ≤3/10 n=294 n (%)*	Pain Interference Score >3/10 n=135 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Preoperative malignancy status*							
Possibly malignant or Malignant	171	122 (71.3)	49 (28.7)	1.0	-		
Not malignant	256	171 (66.8)	85 (33.2)	1.2	0.8, 1.9	-	NA
DEMOGRAPHIC & CLINICAL COVARIATES							
Age							
≥56 years	101	84 (83.2)	17 (16.8)	1.0	-	-	-
45-55 years	168	116 (69.0)	52 (31.0)	2.2	1.2, 4.1	1.8	n.s
18-44 years	160	94 (58.5)	66 (41.2)	3.5	1.9, 6.4	2.4	1.2, 4.6
Marital Status							
Single/Divorced/							
Widowed	123	80 (65.0)	43 (35.0)	1.0	-		
Married	306	214 (69.9)	92 (30.1)	0.8	0.5, 1.2	-	NA
Racial Heritage ^							
Caucasian	399	277 (69.4)	122 (30.6)	1.0	-		
Non-Caucasian	29	16 (55.2)	13 (44.8)	1.8	0.9, 4.0	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable Analysis	
		Pain Interference Score ≤3/10 n=294 n (%)*	Pain Interference Score >3/10 n=135 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Highest education grade achieved							
≤High school diploma	137	94 (68.6)	43 (31.4)	1.0	-		
> High school diploma	292	200 (68.5)	92 (31.5)	1.0	0.6, 1.6	-	NA
Employment Status							
Not employed/retired /other	146	99 (67.8)	47 (32.2)	1.0	-		
Employed full time or part time	283	195 (68.9)	88 (31.1)	1.0	0.6, 1.5	-	NA
Body Mass Index (kg/m ²)							
≤24.9	126	83 (28.2)	43 (31.9)	1.0	-		
25-29.9	126	88 (29.9)	38 (28.1)	0.8	0.4, 1.4	-	NA
≥30	177	123 (41.8)	54 (40.0)	0.8	0.5, 1.4	-	NA
Current Smoker							
Yes	90	63(21.4)	27 (20.0)	1.0	-		
No	339	231 (78.6)	108 (80.0)	1.1	0.6,1.8	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable Analysis	
		Pain Interference Score ≤3/10 n=294 n (%)*	Pain Interference Score >3/10 n=135 n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Previous Abdominal Surgery							
Yes	295	198(68.0)	97 (72.4)	1.0	-	-	-
No	130	93 (32.0)	37 (27.6)	0.8	0.5, 1.3	-	NA

^ 1 participant missing
 ◆ 4 participants missing
 ♦ 2 participants missing
 ~ 7 participants missing

① Centre for Epidemiological Studies - Depression Scale

② Seven Symptoms Screen Test (for somatization)

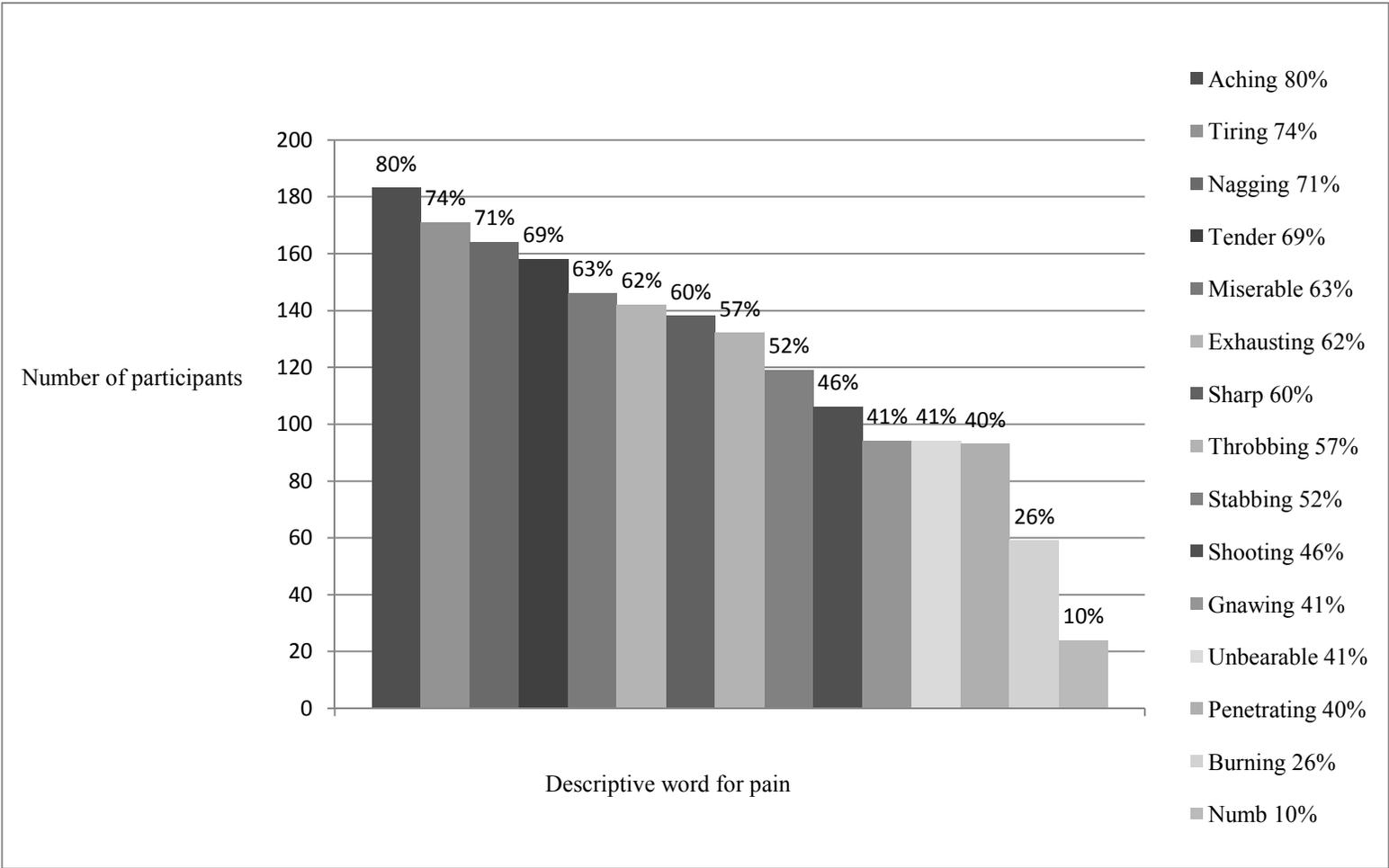
*Values do not always equal 100% due to rounding

n.s- Not significant

NA- Not Applicable – not significant at bivariate analysis so not included in multivariable analysis

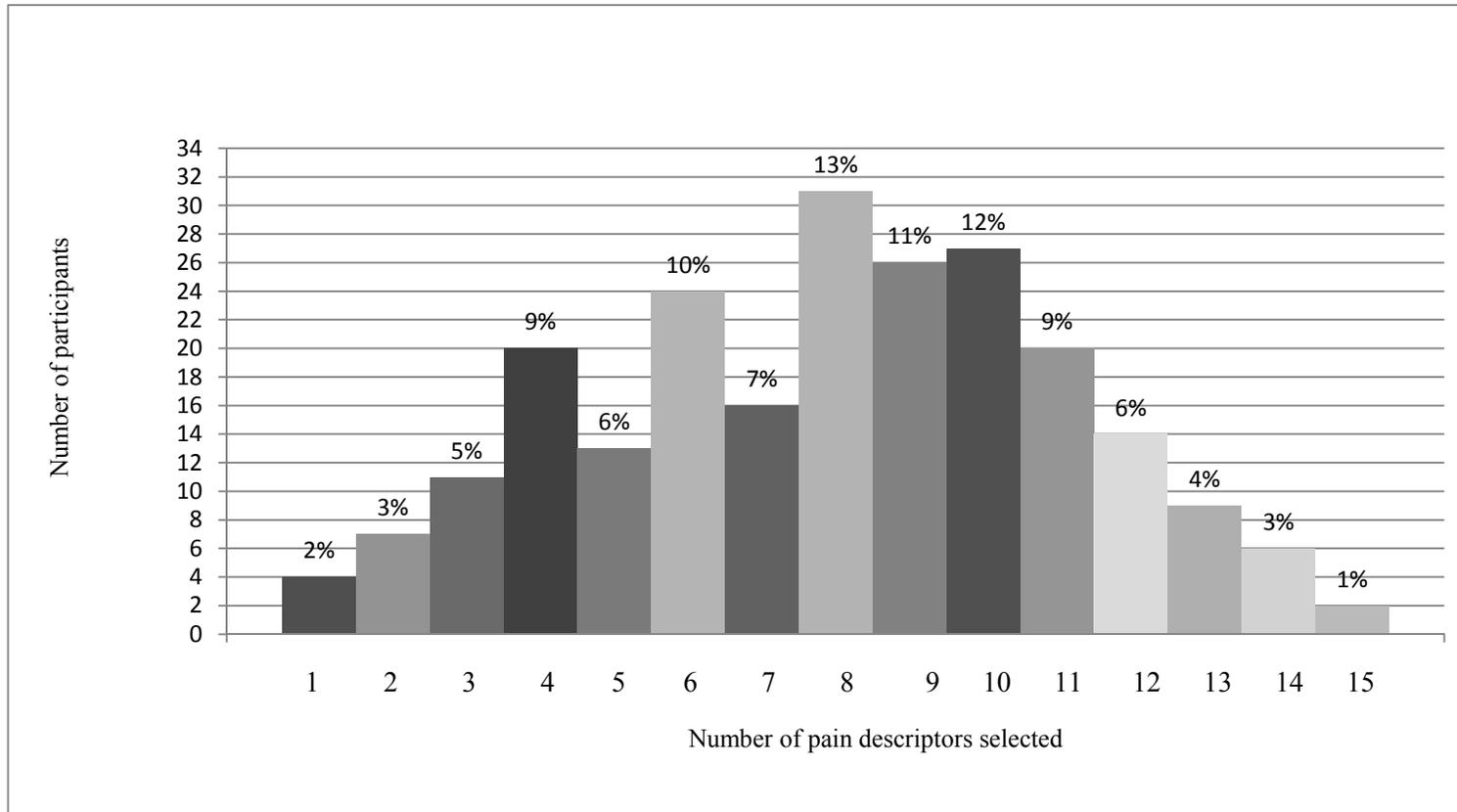
Waiting for Surgery: Pain & Psychological Symptoms

Figure 3.1 Total Number and Percentage of Participants Using Each Pain Descriptor (n=230)



Waiting for Surgery: Pain & Psychological Symptoms

Figure 3.2 Number and Percentage of Participant (n=230) using 1-15 Pain Descriptors



Chapter 4

Manuscript B - Prepared for submission to the Journal of Women's Health

The Association between Symptoms and Healthcare Utilization in Women Waiting for
Gynaecological Surgery

Sarah Walker, RGN, RN, BSc (Hons); Margaret B. Harrison, RN, PhD; Wilma M.
Hopman, BAH, MA; Elizabeth G. VanDenKerkhof RN, DrPH

Send all correspondence to:

Elizabeth G. VanDenKerkhof

Dept of Anesthesiology

Kingston General Hospital

76 Stuart St.

Kingston, Ontario, Canada K7L 2V7

613-549-6666, x3964

FAX: 613-548-1375

Email: ev5@queensu.ca

Copyright ©Sarah Walker, September 2009

Waiting for Surgery: Pain & Psychological Symptoms

Abstract

Background: There is growing interest in the impact of waiting for surgery, a situation which occurs for many elective procedures including gynaecological surgery. The focus of this research was the physical and psychological symptoms and healthcare utilization for pain management whilst waiting for surgery. **Objective:** Frequency of healthcare utilization due to pain was examined in addition to characteristics of women waiting for gynaecological surgery. **Method:** The data were collected for a larger study and comprised of 429 women in a tertiary care centre in southeastern Ontario. Anxiety was measured using the State Trait Anxiety Inventory (STAI), and depression with the Centre for Epidemiologic Studies Depression Scale (CES-D). Pain was assessed using the Brief Pain Inventory (BPI). Women also reported on their healthcare utilization for pain over the past 12 months. The length of wait was obtained from hospital waiting data. **Results:** 18.0% of women had a high anxiety score, 37.1% demonstrated a risk of depression needing treatment. Regarding healthcare utilization for pain, 250 (58.3%) women had a total of 1417 healthcare visits and 31.2% of participants had 2-5 visits each during the previous 12 months. Healthcare utilization for pain was more frequent in younger, married, employed women and those with high trait anxiety. Younger women, those with higher education, non-smokers and shorter waiting time were more likely to utilize emergency service. Healthcare utilization was also significantly greater with moderate to severe pain intensity and interference. **Conclusion:** A substantial number of

Waiting for Surgery: Pain & Psychological Symptoms
visits to healthcare practitioners while waiting for surgery occur because of pain. Improved understanding of the impact of unpleasant symptoms on the waiting experience was gained. Primary care practitioners can then direct care towards areas of need.

Waiting for Surgery: Pain & Psychological Symptoms

Introduction

Waiting for healthcare has been identified as a common experience for today's patients (Fogarty & Cronin, 2008; Janzen & Hadjistavropoulos, 2008). Specifically, there is recognition that the waiting time for surgery has increased due to the growing demand upon health services (Hilkuysen et al., 2005; Fogarty & Cronin). Evidence is emerging about the high physical and psychological costs to individuals while waiting for surgery (Esmail et al., 2008). For instance, waiting for surgery is an experience frequently associated with inducing stress (Derrett, Paul & Morris, 1999; Irvin, 2001; Triffaux et al., 2001; Oudhoff, Timmermans, Knol, Bijnen, & van der Wal, 2007). In Canada, 49-71% of individuals waiting for surgery in 2005 reported being affected by worry, stress and anxiety (Statistics Canada, 2006). Economic costs of waiting for surgery also impact upon the healthcare system; prolonged waiting times may result in additional need for healthcare resources, through greater utilization of services with subsequent increased costs (Esmail et al., 2008; British Columbia Medical Association [BCMA] & Canadian Medical Association [CMA] 2006; CMA 2008).

Excessive waiting for healthcare over an appropriate length of time has caused healthcare providers and the public to express concern, and accordingly, in 2004, the Canadian Ministry of Health and Long Term Care developed the Wait Time Strategy. A primary aim was to prioritize and improve patient access to surgery by reducing waiting times (Wait Time Strategy, 2008).

Waiting for Surgery: Pain & Psychological Symptoms

Oudhoff, Timmermans, Bijnen, & van der Wal's (2004) review of literature on the influence of waiting for surgery on patients' physical, psychological and social factors found only 7 studies between 1985 and 2003. The study indicated that physical, psychological and social impacts arose but the limited data provided no strong evidence as to the extent of these consequences. Further research was recommended on the effect that waiting for surgery has on patients' health and utilization of healthcare.

Pain is a predominant symptom frequently experienced by gynaecological patients awaiting surgery. Types of pain include dysmenorrhoea, premenstrual pain, ovulatory pain and other cyclic pain, which may develop into chronic pelvic pain (Martin, 2006). Although pain is recognized to be a contributing factor in increased healthcare utilization (Mantyselka et al., 2001; Barsky, Orav & Bates, 2006; McClish et al., 2006; Von Korff, Lin, Fenton, & Saunders, 2007), evidence regarding the impact of pain on healthcare utilization for gynaecological patients has not been examined. A recent study describing conditions specific to women and their ensuing healthcare utilization, found one fifth of women to have sought healthcare for female-specific conditions during a single year, with gynaecological disorders being the most commonly cited reason (Kjerulff, Frick, Rhoades & Hollenbeak, 2007). The study described the increase to healthcare expenditure but did not comment on pain-specific healthcare utilization.

Some evidence for increased healthcare utilization for pain in women is recognized in the literature. However, these surveys were not specific to women waiting for gynaecological surgery. Zondervan et al. (2001) found 59% of women who

Waiting for Surgery: Pain & Psychological Symptoms
experienced pelvic pain sought medical treatment for their symptoms. Also, Grace and Zondervan (2004) identified that 36% of women who had recently sought healthcare had done so because of experiencing pain.

Kazanjian, Morettin and Cho (2004) acknowledged further research was needed to better understand women's health issues and subsequent healthcare utilization. The purpose of this study is to document the physical and psychological characteristics and healthcare utilization of patients waiting for gynaecological surgery.

Methods

The research objectives were to describe symptoms experienced by women waiting for gynaecological surgery; describe the healthcare utilization for pain of these women; and explore the relationship between symptoms and healthcare utilization for pain.

Study Design

This was a single centre cross sectional study of women waiting for a gynaecological surgical procedure. Data for this study were collected as part of a larger prospective study on the development of chronic post surgical pain in women undergoing gynaecological procedures. Recruitment and consent were carried out at the time of admission for surgery. The women were asked to report on recent physical and psychological symptoms and on healthcare utilization for pain over the previous 12 months. Ethics approval was obtained from the Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board. The convenience sample was

Waiting for Surgery: Pain & Psychological Symptoms

drawn from the waiting list of women from Kingston General Hospital, a tertiary care facility in southeastern Ontario which serves more than 500,000 people in the local and surrounding community (KGH, 2009).

Inclusion/Exclusion Criteria

All participants were English-speaking women aged 18 years or older waiting to undergo gynaecological surgery. Patients were excluded if they were diagnosed with Alzheimer's disease or another form of cognitive impairment such as dementia or a neurological disorder.

Conceptual Framework

The Theory of Unpleasant Symptoms was selected to guide the methodology for this study. The theory illustrates the interplay between situational, psychological and physiological factors and their effect on the experience of symptoms (Lenz, Pugh, Milligan, Gift, & Suppe, 1997). For this study the adapted conceptual framework presented being on a waiting list for surgery as the situational factor, the psychological factors as depression and anxiety, the diagnosis of a gynaecological condition as the physiological factor and the unpleasant symptom was pain. The theory then illustrates that the interaction of symptoms and patient characteristics leads to a performance or activity, which in this study relates to seeking healthcare utilization for pain. The performance of healthcare utilization may have a feedback effect on the situational, psychological and physiological factors, and it is also postulated within this conceptual framework that the feedback loop could affect the performance.

Measures

The independent variables for this analysis were situational (waiting time), psychological (depression, anxiety) and physiological (gynaecological diagnosis and pain) factors. As pain is often a major component of healthcare utilization, the primary dependent variable for this study was healthcare utilization for pain. Covariates include demographic, surgical and gynaecological information.

Measurement Tools

The data collection comprised of 5 patient-completed questionnaires gathering information on pain, psychological factors and healthcare utilization. Additional data on smoking status, body mass index (BMI) and registration with a family practitioner were gathered from reviewing patient chart data.

Situational Factors

The women enrolled in this study all had a period of waiting time for surgery and these data were collected from the hospital “wait 2” data (Wait Time Strategy, 2008). “Wait 2” is defined as the time between the decision to treat and the date of surgery. For this analysis the “adjusted days waiting” was used as it adjusts for time that the patients were not available for surgery and therefore more accurately reflects the actual waiting time.

Psychological Factors

Anxiety

Anxiety is an experience which can be caused by social, economic, psychological or physical stressors. The World Health Organization (WHO) describes anxiety in terms of feelings of impending doom, restlessness, and inability to concentrate, make decisions, carry out work, eat or sleep (WHO, 2001). Measurement of anxiety utilized the State Trait Anxiety Inventory (STAI) a self-report measurement tool of 20 questions asking about general feelings (trait anxiety). The ranges of scores were 20-80 with a higher score indicating a greater degree of anxiety. Validity and reliability were demonstrated by Ray (1984) with a Cronbach alpha of 0.84 and 0.91 in the general population. The STAI was used by Carr, Brockbank, Allen and Strike (2006) to examine anxiety in women prior to and following gynaecological surgery and by Oudhoff et al. (2007), to examine patients waiting for surgery. For this study, participants were categorized based on the trait anxiety score of < 45 (low anxiety), or ≥ 45 (high anxiety) (Carr et al.).

Depression

Depression, as defined by the WHO, is “a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy and poor concentration” (WHO, 2008). Depression was measured using the Centre for Epidemiologic Studies Depression Scale (CES-D), which was designed to study depression in the general population using previously validated depression scales such as the Beck and Zung scales (Radloff, 1977). Shrout and Yager

(1989) recognized the CES-D Cronbach alpha of 0.84 and 0.91 in patient groups, signifying reliability. The CES-D, a 20 item questionnaire, involves self-reporting of feelings during the past week. The scoring for depression was the total out of 60 possible points, with a higher score indicating a greater degree of depression. Magni, Moreschi, Rigatti-Luchini and Merskey used the CES-D to measure depression in a study about depression and chronic musculoskeletal pain (1994). For this study participant categories were based on a CES-D score <16 or ≥ 16 or more which indicates a greater number of depressive symptoms and suggests a risk of depression that requires treatment (Radloff, 1977 & Beekman et al., 1997).

Physiological Factors

Gynaecological Variables

Self-reported menstrual status was classified into no longer menstruating due to natural or surgical means, or not stopped/unsure. An assumption was made that if they were unsure about their periods stopping, some recent bleeding had probably occurred, and these women were assigned to the periods not stopped category. Data regarding hormone replacement therapy (HRT) and oral contraceptives were collected as possible factors related to hormones and the pain experience; in each case the participants were grouped according to whether they were taking the prescription or not. Lastly, the self-reported preoperative malignancy status was identified as possibly malignant/malignant or not malignant.

Physical Symptom

Pain

The International Association for the Study of Pain (IASP) recognizes pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”. The definition further describes pain as “an unpleasant feeling in a part or parts of the body that is therefore also an emotional experience” (IASP, 2007). The Brief Pain Inventory Long Form (BPI-LF), a multidimensional assessment instrument, developed from the Wisconsin Brief Pain Inventory measures the severity of pain and the impact of pain on daily function (Daut, Cleeland, & Flanery, 1983). Participants rate the intensity of their pain ‘over the past week’ and ‘right now’. The rating of intensity was on a numerical scale of 0 (no pain) to 10 (pain as bad as you can imagine). Pain interference is rated with activities during the past week between 0 (does not interfere) and 10 (completely interferes). Scoring of both the intensity and interference of pain is carried out independently. Validation and reliability were assessed by Tan, Jensen, Thornby and Shanti (2004) with the Cronbach alpha of 0.85 for intensity of pain and 0.88 for pain interference. The BPI-LF was used by Subocz et al. 2007 to document pain in women undergoing cesarean section.

For this study pain intensity and pain interference scores obtained from the BPI-LF were examined. Pain was dichotomized into none/mild ($\leq 3/10$) and moderate/severe ($> 3/10$) for the purposes of the outcome variable.

Demographic and Clinical Covariates

Potential covariates included demographic and clinical covariates that are potentially or known to be associated with the primary outcome of healthcare utilization. Age was categorized according to the documented menopausal range of 45-55 years (Northrup, 2006) (p559), creating the groups of premenopausal (18-44 years), menopausal (45-55 years) and postmenopausal (≥ 56 years). Marital status was categorized as married or not married. Due to the small size of some of the racial categories the variable of racial heritage was divided into Caucasian and non-Caucasian groups. Education was classified into two groups incorporating no diploma with high school diploma versus trade or professional school certificate/diploma, some university/postgraduate degree(s). Part-time and full time employed participants were combined into the employed category; the remaining participants, not employed, retired, homemaker and other were classified together. BMI, an established measure for identifying if a person is overweight or obese, was categorized according to WHO classification (2006); with the ranges of underweight/normal weight ≤ 24.9 kg/m², overweight 25-29.9 kg/m² and obese ≥ 30 kg/m². The underweight and normal categories were combined due to the small number of participants in the underweight, < 18.5 kg/m², range. Participants were classified by current smoking status and finally, patients were grouped according to whether or not they had undergone previous abdominal surgery.

Performance- Primary Outcome

Healthcare Utilization

A healthcare utilization questionnaire from the larger prospective chronic post surgical pain study was used to ask about the number of visits to a healthcare practitioner 'because of pain'. For this study, the gathered information identified the total number of visits in the previous 12 months for pain. For the main outcome variable, overall healthcare utilization was dichotomized into high (≥ 3 visits) vs. low (< 3). This classification allowed for a yearly check up plus one additional visit to be considered low or normal healthcare utilization. The secondary outcome was looking at the women who had visited an emergency room in the previous 12 months and this category was dichotomized into those that visited the emergency room (Yes) and those that did not visit the emergency room (No). Similarly, Barsky et al. (2006) used a questionnaire when examining healthcare utilization patterns of patients who somatize, as did Subocz et al. in 2007 who examined healthcare utilization of elective cesarean section patients.

Statistical Analysis

Data analysis was carried out using the SPSS software version 16.0. Given the descriptive nature of this study a sample size calculation was not conducted. Descriptive statistics were calculated using frequency and percentages for categorical variables and means, standard deviation, range and interquartile range for continuous variables. Bivariate analysis was conducted using the Chi square statistical test to assess for associations between healthcare utilization and the independent variables. If the

Waiting for Surgery: Pain & Psychological Symptoms

significance level was $p=0.1$ or less in bivariate analysis, variables were included in a logistic regression analysis. The results are presented with the odds ratio (O.R.) and confidence intervals (C.I.) for both bivariate and multivariable analyses. The cut off for determining whether a result was statistically significant was set at $p\leq 0.05$.

Results

Of the 635 women approached and invited to join the study, 441 were recruited, and 6 withdrew before completing the preoperative questionnaires, leaving 435 patients with complete data. A review of the data set identified 6 participants who had undergone urological surgery. Due to the small sample size of urological patients they were not included in this study, leaving 429 participants waiting for gynaecological surgery. Table 4.1 presents situational, psychological physiological and demographic factors. Age ranged from 18-83 years with mean of 48.3 and a standard deviation (SD) of 11 years. Predominantly Caucasian (93.2%), 68.8% had previous abdominal surgery. Forty point three percent were no longer menstruating of these 10.5% had stopped due to surgical means. Thirty nine point nine percent of participants self-reported malignant or possibly malignant etiology.

Situational Factors

Adjusted days waiting ranged from 0-680 days, with a mean of 63.8 days. Analysis showed the women that waited the longest, more than 8 weeks, were 0.2 times less likely to utilize an emergency room for healthcare.

Waiting for Surgery: Pain & Psychological Symptoms

Psychological Factors

The mean trait anxiety score was 34.2 ± 10.7 out of a possible range 20-80 and 18.0% of women had a high anxiety score of ≥ 45 . The mean depression score was 13.8 and a score indicative of depression (>16) occurred in 37.1% of participants. High anxiety scores were associated with greater healthcare utilization and such women were 2.6 times more likely to utilize healthcare in the previous 12 months.

Physical Symptom

Pain

Thirty point five percent of participants reported moderate to severe ($>3/10$) pain intensity over the past week and 31.5% reported moderate to severe pain interference score ($>3/10$). Of the women that experienced pain in the last week 81.4% believed their pain was due to their primary gynaecological condition. Women with higher pain intensity scores, moderate to severe, were 6.6 times more likely to utilize healthcare than those with mild pain intensity; and 2.3 times more likely to utilize emergency room healthcare than women with mild pain intensity. Women with higher pain interference scores, moderate to severe, were 6.7 times more likely to utilize healthcare than those with mild pain interference; and 3.1 times more likely to utilize emergency room healthcare than those with mild interference.

Demographic and Clinical Covariates

The younger age group 18-44 years was 4 times more likely to utilize healthcare than the oldest age group and remained the most frequent utilizers, visiting the

Waiting for Surgery: Pain & Psychological Symptoms

emergency room 3.6 times more often than the oldest age group. Married women were 2.3 times more likely to utilize healthcare than single, divorced or widowed women. Participants that were employed either part time or full time utilized healthcare 1.8 times more than the category of unemployed, retired or other. Participants with more education were 2.3 times more likely to utilize emergency room healthcare than those with a diploma or lower as were non-smokers who had 4.5 times higher visits than smokers.

Performance- Primary Outcome

Healthcare Utilization

The primary outcome for this study was healthcare utilization for pain (Table 4.2). There were 1417 total healthcare visits to a doctor, specialist, emergency room or walk-in clinic by 58.3% of women. Forty one point seven percent of participants did not access healthcare for pain. Thirty one point two percent of women made 2-5 healthcare visits over the previous 12 months and 19.8% participants utilized healthcare for pain 6 or more times. Healthcare utilization for pain was predominantly sought from physicians, with a total of 703 visits by 48.5% of the women. Specialist utilization was the next frequently visited service, with 495 visits by 45.7% of participants. 150 visits were made to the emergency room in the preceding 12 month period by 17.2% of women. The least utilized healthcare facility was the walk-in clinic, where 5.6% of participants making 69 visits in the previous 12 months.

In addition to visiting the healthcare professionals listed above, participants were asked: ‘In the past 12 months how many times have you seen other health care

Waiting for Surgery: Pain & Psychological Symptoms
professionals (e.g. chiropractors, physiotherapists) because of pain?' 16 % of participants visited other healthcare professionals, with a mean of 2.5 and range 0-156.

Relationship between Symptoms and Healthcare Utilization for Pain

Two outcomes were selected to explore the relationship between symptoms and healthcare utilization for pain. The main outcome variable was overall healthcare utilization (doctor, specialist, emergency room or walk-in clinic) in the previous 12 months. The secondary outcome was looking at the women who had visited an emergency room in the previous 12 months.

Being younger, menstruating, moderate to high pain intensity and interference, anxiety and depression were associated with high healthcare utilization in bivariate analysis. All variables that had an association of $p < 0.1$ were entered into multivariable analysis and the O.R. and 95 % C.I. were then calculated for each variable. Age (O.R. 4.0, 95% C.I. 2.0, 8.0), marital status (O.R. 2.3, 95% C.I. 1.4, 3.9), employment status (O.R. 1.8, 95% C.I. 1.0, 3.0), pain intensity (O.R. 6.6, 95% C.I. 4.0, 10.9), pain interference (O.R. 6.7, 95% C.I. 4.0, 11.1) and anxiety (O.R. 1.4, 95% C.I. 1.4, 4.7) were associated with more than 3 healthcare utilization visits (Table 4.3).

Pain intensity, pain interference and depression were associated with high healthcare utilization to an emergency room during the previous 12 months in bivariate analysis. Multivariable analysis showed age (O.R. 3.6, 95% C.I. 1.5, 9.0), education (O.R. 2.3, 95% C.I. 1.2, 4.5), smoker (O.R. 4.5, 95% C.I. 1.8, 11.3), pain intensity (O.R. 2.3, 95% C.I. 1.3, 4.0), pain interference (O.R. 3.1, 95% C.I. 1.8, 5.5) and adjusted days waiting

Waiting for Surgery: Pain & Psychological Symptoms

(O.R.0.2, 95% C.I.0.1,0.5) were associated with visiting an emergency room in the previous 12 months (Table 4.4).

Due to the high percent agreement between pain intensity and pain interference only pain interference was included when running logistic regression for all the variables (Tables 4.3 & 4.4). The same analysis was then re-run with only intensity included and the same variables were found to be significant.

Age was also run as a continuous variable and included in the multivariable analysis. For both healthcare utilization measures age was significant (overall: O.R. 0.948 (C.I. 0.929, 0.967); emergency room: O.R. 0.953 (C.I. 0.929, 0.978)), with reduced healthcare utilization with increasing age.

Discussion

The overall aim of this study was to gain a better understanding of healthcare utilization for pain in women waiting for gynaecological surgery. One of the major findings in this study was that over half of participants sought healthcare for pain in the 12 months preceding gynaecological surgery. Women seeking healthcare were also more likely to be younger, pre or peri-menopausal, and exhibit psychological symptoms of depression and anxiety. These supplementary visits are an additional expense on the healthcare service. A number of characteristics were identified in the women seeking healthcare for pain.

Waiting for Surgery: Pain & Psychological Symptoms

Situational Factors

The waiting time data showed 96% of participants were within the 26 weeks target for the wait time strategy with 17 women waiting more than the priority 4 target. Waiting time data appears to be providing a measure of priority rating. Priority rating, information from hospital waiting data, indicates the severity of a patient's condition. Patients waiting for a shorter time were found to have the most emergency room visits. This finding was not expected as a longer wait time was anticipated to correspond with a greater number of healthcare utilization visits. It is hypothesized therefore that patients with a more severe gynaecological condition (high priority) waited the shortest number of days and the women with less extreme diagnosis (low priority) were subsequently waiting longer. Patients requiring emergency room visits for pain were potentially therefore the women with more severe conditions and were possibly allocated a high priority score. Practitioners might lessen the number of healthcare utilization visits to the emergency room if women are given supplementary education on pain management and healthcare practitioners could be cognizant that high priority patients may require additional pain management.

Psychological Factors

Overall, our results show 18% of participants suffered from a high anxiety score with a mean trait anxiety score of 34.2. A woman with a high anxiety score was nearly twice as likely to utilize healthcare when compared to participants with lower anxiety scores. These results supported evidence that a number of women waiting for

Waiting for Surgery: Pain & Psychological Symptoms

gynaecological surgery suffer from anxiety. A prevalence study in Sweden found 12.1% of gynaecological patients to have anxiety (Sundström, Bixo, Björn, & Åström, 2001). In a study by Carr et al. (2006), which also measured trait anxiety prior to undergoing gynaecological surgery, the mean anxiety score was 40.5. Persson, Wijma, Hammer and Kjolhede (2006) found mean trait anxiety scores of 34.7 before undergoing abdominal hysterectomy and 35.6 for laparoscopic hysterectomy patients. During preoperative assessment for gynaecological surgery, recognition of patients who have anxiety may enable them to be targeted for additional interventions to decrease their anxiety and potentially reduce additional healthcare utilization for pain.

Demographic Covariates

In this current study the youngest age group, 18-44 years, were more likely to use the emergency room than the older women, aged ≥ 56 years. This is similar to results obtained from a large nationwide survey in the USA on emergency room healthcare utilization for gynaecological disorders (Curtis, Hillis, Kieke, Brett, Marchbanks, & Peterson 1998); they found the highest rates for emergency room visits were with the youngest women. Curtis et al. also found the highest rates for emergency room visits were with black women when compared to white women. Our findings were similar with more non-Caucasians using the emergency room (35%) compared to Caucasians (16%); however race was not significant after controlling for these factors.

Physical Symptom

Pain

Our findings that women with higher pain intensity and interference were more likely to seek healthcare are consistent with those reported in a recent Canadian study in southeastern Ontario where high pain interference was associated with higher rates of utilization (Tripp, VanDenKerkhof & McAlister, 2006). These findings add to the evidence that a greater number of healthcare visits occur for patients with higher pain intensity and interference; in this study women with moderate to severe pain intensity and pain interference scores were over six times more likely to utilize healthcare for pain. When specifically examining the emergency room visits, women with moderate to severe pain intensity and pain interference scores were more likely to visit the emergency room. Similarly, although not specific to gynaecological populations Chrubasik, Junck, Zappe and Stutzke (1998), and Rohrer, Merry, Adamson, and Barnes (2008) found that people with higher pain intensity had a greater number of healthcare visits. Within this study pain intensity and interference occurred to a moderate or severe degree in a substantial number of participants and a majority of women believed this pain was related to their gynaecological condition (81.4%) suggesting insufficient pain management related to their impending surgery. Implementing changes to improve pain control might therefore be of benefit for gynaecological patients waiting for surgery.

Study Limitations

A study limitation was the use of self-reported questionnaires, with no additional methods to corroborate information; however the prevalence of pain and pain characteristics all correlated with other studies within the literature. Also, using cross sectional data the direction of the causal link is not known, i.e. did higher levels of pain intensity or pain interference result from the individual psychological factors or did the high pain intensity and pain interference cause the psychological factors to be higher? Despite this uncertainty, it is apparent that both physical and psychological factors exist and healthcare practitioners need to be cognizant of the potential influence on patients prior to surgery.

Another limitation is the self-reporting of healthcare utilization for pain over the previous 12 months, with a potential for recall bias impacting the data collected. A review of literature on recall bias regarding healthcare utilization found conflicting information between the accuracy of patient self-reports and medical records. Underreporting of healthcare utilization was recognized in cases where healthcare utilization is greater (Ritter et al., 2000; Jordan, Jinks, & Croft 2006); and patients with poorer health status were found to over report healthcare utilization (Jordan et al., 2006). Recall bias might therefore exist in this study, for example, if patients with greater pain over reported healthcare utilization, and this needs to be taken into consideration when interpreting the frequency of healthcare utilization for pain. The healthcare utilization recall for this study is specifically about pain visits. Participants might have incorrectly

Waiting for Surgery: Pain & Psychological Symptoms

recalled healthcare utilization visits in general as well as the pain specific visits. It is known however that healthcare utilization is frequently related to pain, as recognized by Mantyselka et al. (2001) who found 29% of visits to a family physician were because of pain and the Canadian Pain Consortium (2001) discovered 80% of all physician visits had a pain-related component.

It was also unknown to what extent the women who declined to join the study suffered from physical and psychological characteristics and whether the women that enrolled were more interested because of a personal experience with pain. On the contrary, women with high levels of pain may not have felt well enough to complete the questionnaires prior to surgery. Therefore it is not known how this bias might affect the study. However, this study included a substantial population and a significant number of these women reported no pain intensity in the past week and 53% of the population reported experiencing pain. A prevalence study of pain carried out in the same locality of southeastern Ontario found 49% of the population reported chronic pain and 60% of the population experienced pain from a low to high degree (Tripp et al., 2006) which is similar to our result and therefore increases the likelihood that our study is representative of the preoperative gynaecological population.

Study Attributes/Strengths

A review of the data highlighted that very few questions were unanswered by participants, therefore minimal missing data increases the validity of the data collected. The sample size of 429 participants was sufficient to allow several variables to be

Waiting for Surgery: Pain & Psychological Symptoms included in the analysis and increased the probability of the sample being representative of gynaecological patients waiting for surgery. Furthermore the comprehensive data collected in this study - situational, psychological, physiological and demographic factors - is unique to the literature on waiting for surgery. A further strength of this study is the fact that the recall period for reporting factors and symptoms was short i.e., within the last week and in general, with the exception of healthcare utilization where it is necessary to consider a longer recall period., reporting of gynaecological, physical and psychological symptoms were all measured within a short time period, therefore diminishing the chance of recall bias. The participants in this study consisted of a homogeneous population, with all women waiting to undergo gynaecological surgery. Having a population with similar characteristics will lower the variability of reporting which could occur in groups with different characteristics. A helpful component of this study was that the location for healthcare utilization was clearly identified, i.e. doctor, specialist, walk-in clinic or emergency room. Acknowledging the location of healthcare utilization for pain might have increased the accuracy of recall. It should be recognized therefore that patients recalling healthcare utilization for pain were reporting a meaningful component of their waiting experience.

Implications for Healthcare Professionals

Empirical evidence suggests that management of patients with pain improves with early intervention (Linton, 2005 chap. 13 p128). Healthcare professionals may feel limited in their ability to manage pain in their patients (Katona et al., 2005); however, this

Waiting for Surgery: Pain & Psychological Symptoms study provides them with an improved understanding of the impact of unpleasant symptoms, such as anxiety and pain, which patients experience while waiting for surgery. Waddell and Warnock (2008) suggest efficiency and planning of surgical procedures from the preoperative stage will lead to better-quality patient education and improved patient expectations, and potentially enrich satisfaction of experience. The provision of efficient primary healthcare will facilitate health promotion, improve patient satisfaction and subsequently improve cost-effectiveness through reduced healthcare utilization for pain, despite waiting times. A recommendation would be to implement preoperative care pathway planning for patients undergoing gynaecological surgery with the aim of reducing the impact waiting for surgery has on both the patient and the healthcare system.

Summary

This study has provided evidence that women experience unpleasant symptoms while waiting for gynaecologic surgery. In particular, a substantial number of visits to healthcare practitioners occur because of pain. Consideration of physical and psychological characteristics is therefore supported and healthcare practitioners in the primary care setting are encouraged to carry out adequate preoperative assessment and direct care towards these highlighted areas.

Future research should examine interventions in the preoperative healthcare setting designed to target psychological and physical needs of patients prior to surgery. The interventions would be implemented with the aim of reducing healthcare utilization for pain and research would therefore evaluate this effect.

Waiting for Surgery: Pain & Psychological Symptoms

References

- Barsky, A. J., Orav, E. J., & Bates, D. W. (2006). Distinctive patterns of medical care utilization in patients who somatize. *Medical Care*, 44(9), 803-811.
- Beekman, A. T., Deeg, D. J., Van Limbeek, J., Braam, A. W., De Vries, M. Z., & Van Tilburg, W. (1997). Criterion validity of the center for epidemiologic studies depression scale (CES-D): Results from a community-based sample of older subjects in the netherlands. *Psychological Medicine*, 27(1), 231-235.
- British Columbia Medical Association (BCMA) & Canadian Medical Association (CMA) 2006. The Economic Cost of Wait Times in Canada. Retrieved September 19th 2009, from http://www.bcma.org/files/Economic_cost_of_wait_times.pdf
- Canadian Medical Association (2008) The Economic Cost of Wait Times in Canada 2008 Retrieved August 25th 2009, from http://www.cma.ca/multimedia/CMA/Content/Images/Inside_cma/Media_Release/pdf/2008/EconomicReport.pdf
- Canadian Pain Consortium (2001). Canadian Consortium on Pain Mechanism Diagnosis and Management. <http://www.curepain.ca/final.htm> Last retrieved November 2nd 2006. Unable to access link August 25th 2009.

Waiting for Surgery: Pain & Psychological Symptoms

- Carr, E., Brockbank, K., Allen, S., & Strike, P. (2006). Patterns and frequency of anxiety in women undergoing gynaecological surgery. *Journal of Clinical Nursing, 15*(3), 341-352.
- Chrubasik, S., Junck, H., Zappe, H. A., & Stutzke, O. (1998). A survey on pain complaints and health care utilization in a german population sample. *European Journal of Anaesthesiology, 15*(4), 397-408.
- Curtis, K. M., Hillis, S. D., Kieke Jr, B. A., Brett, K. M., Marchbanks, P. A., & Peterson, H. B. (1998). Visits to emergency departments for gynecologic disorders in the united states, 1992-1994. *Obstetrics and Gynecology, 91*(6), 1007-1012.
- Daut, R. L., Cleeland, C. S., & Flanery, R. C. (1983). Development of the wisconsin brief pain questionnaire to assess pain in cancer and other diseases. *Pain, 17*(2), 197-210.
- Derrett, S., Paul, C., & Morris, J. M. (1999). Waiting for elective surgery: Effects on health-related quality of life. *International Journal for Quality in Health Care, 11*(1), 47-57.
- Esmail, N., Hazel, M. & Walker, M.A. (2008) Waiting Your Turn Hospital Waiting Lists in Canada 2008 Report - Health Care Policy p 1-145. Retrieved August 25th 2009 from www.fraserinstitute.org/researchandpublications/publications/6240.aspx

Waiting for Surgery: Pain & Psychological Symptoms

- Fogarty, C., & Cronin, P. (2008). Waiting for healthcare: A concept analysis. *Journal of Advanced Nursing*, 61(4), 463-471.
- Grace, V. M., & Zondervan, K. T. (2004). Chronic pelvic pain in new zealand: Prevalence, pain severity, diagnoses and use of the health services. *Australian & New Zealand Journal of Public Health*, 28(4), 369-375.
- Hilkhuyzen, G. L., Oudhoff, J. P., Rietberg, M., van der Wal, G., & Timmermans, D. R. (2005). Waiting for elective surgery: A qualitative analysis and conceptual framework of the consequences of delay. *Public Health*, 119(4), 290-293.
- International Association for the study of Pain (IASP) (2007) Retrieved August 25th 2009 from http://www.iasp-pain.org/AM/Template.cfm?Section=Pain_Definitions&Template=/CM/HTMLDisplay.cfm&ContentID=1728
- Irvin, S. K. (2001). Waiting: Concept analysis. *Nursing Diagnosis*, 12(4), 128-136.
- Janzen, J. A., & Hadjistavropoulos, H. D. (2008). Examination of negative affective responses to waiting for surgery. *Canadian Journal of Nursing Research*, 40(4), 72-91.

Waiting for Surgery: Pain & Psychological Symptoms

Joint Commission for Accreditation of Healthcare Organization (JCAHO) standards

(2001). Retrieved August 25th 2009 from

http://www.jointcommission.org/NewsRoom/health_care_issues.htm

Jordan, K., Jinks, C., & Croft, P. (2006). Health care utilization: Measurement using primary care records and patient recall both showed bias. *Journal of Clinical Epidemiology*, 59(8), 791-797.

Katona, C., Peveler, R., Dowrick, C., Wessely, S., Feinmann, C., Gask, L., et al. (2005). Pain symptoms in depression: Definition and clinical significance. *Clinical Medicine*, 5(4), 390-395.

Kazanjian, A., Morettin, D. & Cho, R. (2004) Health Canada Healthcare utilization by Canadian Women Canadian Institute for Health Information. Retrieved August 25th 2009, from http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=AR_342_E

KGH (2009) Kingston General Hospital Website Retrieved August 25th from <http://www.kgh.on.ca/about/about.asp>

Kjerulff, K. H., Frick, K. D., Rhoades, J. A., & Hollenbeak, C. S. (2007). The cost of being a woman: A national study of health care utilization and expenditures for female-specific conditions. *Womens Health Issues*, 17(1), 13-21.

Waiting for Surgery: Pain & Psychological Symptoms

- Lenz, E. R., Pugh, L. C., Milligan, R. A., Gift, A., & Suppe, F. (1997). The middle-range theory of unpleasant symptoms: An update. *Advances in Nursing Science, 19*(3), 14-27.
- Linton, S.J. (2005) Early interventions: a cognitive-behavioural approach. In Tjoa, E., Law, M. & Kenner, H. (Eds.), *Understanding pain for better clinical practice a psychological perspective* (pp 45, 123-139). Edinburgh: Elsevier.
- Magni, G., Moreschi, C., Rigatti-Luchini, S., & Merskey, H. (1994). Prospective study on the relationship between depressive symptoms and chronic musculoskeletal pain. *Pain 56*(3), 289-297.
- Mantyselka, P., Kumpusalo, E., Ahonen, R., Kumpusalo, A., Kauhanen, J., Viinamaki, H., et al. (2001). Pain as a reason to visit the doctor: A study in finnish primary health care. *Pain, 89*(2-3), 175-180.
- McClish, D. K., Levenson, J. L., Penberthy, L. T., Roseff, S. D., Bovbjerg, V. E., Roberts, J. D., et al. (2006). Gender differences in pain and healthcare utilization for adult sickle cell patients: The PiSCES project. *Journal of Women's Health, 15*(2), 146-154.
- Northrup, C. (2006) *Women's bodies, women's wisdom: creating physical and emotional health and healing* (p559). New York, New York: Bantam Dell.

Waiting for Surgery: Pain & Psychological Symptoms

- Oudhoff, J. P., Timmermans, D. R., Bijnen, A. B., & van der Wal, G. (2004). Waiting for elective general surgery: Physical, psychological and social consequences. *ANZ Journal of Surgery, 74*(5), 361-367.
- Oudhoff, J. P., Timmermans, D. R., Knol, D. L., Bijnen, A. B., & van der Wal, G. (2007). Waiting for elective general surgery: Impact on health related quality of life and psychosocial consequences. *BMC Public Health, 7*, 164.
- Persson, P., Wijma, K., Hammar, M., & Kjolhede, P. (2006). Psychological wellbeing after laparoscopic and abdominal hysterectomy--a randomized controlled multicentre study. *BJOG: An International Journal of Obstetrics & Gynaecology, 113*(9), 1023-1030.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385-401.
- Ray, J. J. (1984). Measuring trait anxiety in general population samples. *Journal of Social Psychology, 123*(2D Half), 189-193.
- Ritter, P. L., Stewart, A. L., Kaymaz, H., Sobel, D. S., Block, D. A., & Lorig, K. R. (2001). Self-reports of health care utilization compared to provider records. *Journal of Clinical Epidemiology, 54*(2), 136-141.

Waiting for Surgery: Pain & Psychological Symptoms

- Rohrer, J. E., Merry, S. P., Adamson, S. C., & Barnes, D. E. (2008). General pain and frequency of medical visits in family medicine: A retrospective analysis of medical records. *Disease Management & Health Outcomes*, *16*(1), 47-52.
- Statistics Canada (2006). *Access to Health Care Services in Canada: January to December 2005*. Catalogue No. 82-575-XIE. Statistics Canada. Retrieved November 14, 2008 from <http://dsp-psd.tpsgc.gc.ca/Collection/Statcan/82-575-X/82-575-XIE2006002.pdf>
- Subocz, E. G., VanDenKerkhof, E. G., Hopman, W. M., Towheed, T. E., Goldstein, D.H., Wilson, R. A., et al. (2007) A pilot study assessing pain and health-related quality of life in women after cesarean section. Unpublished Master's thesis. School of Nursing, Queen's University, Kingston, Ontario, Canada.
- Sundström, I. M. E., Bixo, M., Björn, I., & Åström, M. (2001). Prevalence of psychiatric disorders in gynecologic outpatients. *American Journal of Obstetrics and Gynecology*, *184*(2), 8-13.
- Tan, G., Jensen, M. P., Thornby, J. I., & Shanti, B. F. (2004). Validation of the brief pain inventory for chronic nonmalignant pain. *Journal of Pain*, *5*(2), 133-137.
- Triffaux, J. M., Wauthy, J., Bertrand, J., Limet, R., Albert, A., & Ansseau, M. (2001). Psychological evolution and assessment in patients undergoing orthotopic heart

Waiting for Surgery: Pain & Psychological Symptoms transplantation. *European Psychiatry: The Journal of the Association of European Psychiatrists*, 16(3), 180-185.

Tripp, D. A., VanDenKerkhof, E. G., & McAlister, M. (2006). Prevalence and determinants of pain and pain-related disability in urban and rural settings in southeastern ontario. *Pain Research & Management*, 11(4), 225-233.

Von Korff, M., Lin, E. H., Fenton, J. J., & Saunders, K. (2007). Frequency and priority of pain patients' health care use. *Clinical Journal of Pain*, 23(5), 400-408.

Waddell J.P. & Warnock G.L. (2008) Improving waiting times for surgery. *Canadian Journal of Surgery* 51 (5), 333-334.

Wait Time Strategy (2008) Practical Guide for Clinicians – The Tools and Information to Track Wait Times. Version 3.0 and Gynaecological Surgery Practical Guidelines for Clinicians v1.

World Health organization (WHO) (2001) Anxiety definition. Retrieved August 25th 2009 from <http://www.emro.who.int/MNH/WHO/PublicInformation-Part6.htm>

World Health organization (WHO) Body Mass Index classification (copyright 2006) http://apps.who.int/bmi/index.jsp?introPage=intro_3.html Retrieved August 25th 2009

World Health organization (WHO) (2008) Depression definition. Retrieved August 25th 2009, from <http://www.who.int/topics/depression/en/>

Waiting for Surgery: Pain & Psychological Symptoms

Zondervan, K. T., Yudkin, P. L., Vessey, M. P., Jenkinson, C. P., Dawes, M. G., Barlow, D. H., et al. (2001). The community prevalence of chronic pelvic pain in women and associated illness behaviour. *British Journal of General Practice*, 51(468), 541-547.

Waiting for Surgery: Pain & Psychological Symptoms

Table 4.1 Baseline Characteristics of Women Waiting for Gynaecological Surgery

		Total n=429	% *
		n	
SITUATIONAL FACTORS			
Adjusted Days	< 4 weeks	111	25.9
Waited▪	4-8 weeks	149	34.7
	> 8 weeks	169	39.4
PSYCHOLGICAL FACTORS			
Trait Anxiety	<45	350	82.0
Score▪	≥45	77	18.0
CES-D	<16	270	62.9
Depression	≥16	159	37.1
Score©			
PHYSIOLOGICAL FACTORS - GYNAECOLOGICAL			
Current menstruation status	Not stopped	225	52.4
	Unsure /irregular	31	7.2
	Stopped naturally	128	29.8
	Stopped surgically	45	10.5
Currently taking Hormone Replacement Therapy	Yes	23	6.8
	No	316	93.2
Have taken Birth Control Pills in the past month [✓]	Yes	40	9.5
	No	382	90.5

Waiting for Surgery: Pain & Psychological Symptoms

		Total n=429	% *
		n	
Preoperative	Possibly malignant	99	23.1
Malignancy	Malignant	72	16.8
Status	Not malignant	256	59.7
DEMOGRAPHIC & CLINICAL COVARIATES			
Age	18-44 years	160	37.3
	45-55 years	168	39.2
	>56 years	101	23.5
Marital Status	Single/Divorced/Widowed	123	28.7
	Married	306	71.3
Racial Heritage [^]	Caucasian	399	93.2
	Non-Caucasian	29	6.8
Highest Education Grade Achieved	No diploma	50	11.7
	High school diploma	87	20.3
	Trade or professional school certificate/diploma	150	35.0
	Some University/Postgraduate degree(s)	142	33.1
Employment Status	Unemployed/Retired/Homemaker	111	25.9
	Employed part time or full time	283	66.0
	Other	35	8.2

Waiting for Surgery: Pain & Psychological Symptoms

		Total n=429	% *
		n	
Body Mass Index (kg/m ²)	≤24.9 Underweight/ Normal	126	29.4
	25-29.9 Overweight	126	29.4
	≥30 Obese	177	41.3
Current Smoker	Yes	90	21.0
	No	339	79.0
Previous Abdominal Surgery	Yes	295	68.8
	No	130	30.3
PHYSICAL SYMPTOMS			
Pain Intensity (Average score from x4 BPI ⊙ questions)	≤3/10	298	69.5
	>3/10	131	30.5
Pain Interference (Average score from x7 BPI questions)	≤3/10	294	68.5
	>3/10	135	31.5

Waiting for Surgery: Pain & Psychological Symptoms

Continuous Variables	Mean (\bar{x})	Standard Deviation (sd)	Range (min/ max)	Interquartile range (25% and 75%)
Age in years	48.3	11.0	18-83	41-54
Body Mass Index	29.1	7.4	17-60	24-33
Trait Anxiety	34.2	10.7	20-72	26-41
CES-D scores ^②	13.8	11.6	0-58	5-20
Waiting Time	63.8	60.6	0-680	27-85

^ 1 participant missing

• 2 participants missing

˘ 7 participants missing

*Values do not always equal 100% due to rounding

① Brief Pain Inventory

② Centre for Epidemiological Studies – Depression

Waiting for Surgery: Pain & Psychological Symptoms

Table 4.2 Number of Healthcare Utilization Visits to Practitioners for Pain During 12 Months Prior to Surgery

n= 429	Healthcare practitioner visited				
Number of visits by each participant over 12 month period for pain	Doctor n (column %)	Specialist n (column %)	Emergency room n (column %)	Walk-In n (column %)	Total number of visits n (column %)
0	221 (51.5)	233 (54.3)	355 (82.8)	405 (94.4)	179 (41.7)
1	64 (14.9)	66 (15.4)	42 (9.8)	12 (2.8)	31 (7.2)
2-5	107 (24.9)	122 (28.4)	28 (6.5)	10 (2.3)	134 (31.2)
6-9	24 (5.6)	5 (1.2)	4 (0.9)	0 (0.0)	49 (11.4)
≥10	13 (3.0)	3 (0.7)	0 (0.0)	2 (0.5)	36 (8.4)
Total number of healthcare utilization visits by all participants for pain	703 (49.6)	495 (34.9)	150 (10.6)	69 (4.9)	1417 (100)*

*rounding error

Waiting for Surgery: Pain & Psychological Symptoms

Table 4.3 Bivariate and Multivariable results for Healthcare Utilization <3 or ≥3 Visits in the Past 12 Months for Pain

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable	
		Healthcare Utilization <3 visits in past 12 months n (%)*	Healthcare Utilization ≥3 visits in past 12 months n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
SITUATIONAL FACTORS							
Adjusted Days Waited ▪							
< 4 weeks	111	71 (64.0)	40 (36.0)	1.0	-		
4-8 weeks	149	83 (55.7)	66 (44.3)	1.4	0.9, 2.3	-	NA
> 8 weeks	169	99 (58.6)	70 (41.4)	1.3	0.8, 2.1	-	NA
PSYCHOLOGICAL FACTORS							
Trait Anxiety score▪							
Low (20-44)	350	225 (64.3)	125 (35.7)	1.0	-	-	-
High (≥45)	77	27 (35.1)	50 (64.9)	3.3	2.0, 5.6	2.6	1.4, 4.7
CES-D ① Depression Score							
Low (<16)	270	185 (68.5)	85 (31.5)	1.0	-		
High (≥16)	159	68 (42.8)	91 (57.2)	2.9	1.9, 4.4	-	n.s

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable	
		Healthcare Utilization <3 visits in past 12 months n (%)*	Healthcare Utilization ≥3 visits in past 12 months n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
PHYSIOLOGICAL FACTORS - GYNAECOLOGICAL							
Current Menstruation Status							
Periods stopped surgically or naturally	173	124 (71.7)	49 (28.3)	1.0	-		
Periods not stopped or unsure	256	129 (50.4)	127 (49.6)	2.5	1.7, 3.8	-	n.s
Currently taking Hormone Replacement Therapy							
Yes	23	16 (69.6)	7 (30.4)	1.0	-		
No	316	197 (62.3)	119 37.7)	1.4	0.6,3.5	-	NA
Have taken Birth Control Pills in the past month~							
Yes	40	19 (47.5)	21 (52.5)	1.0	-		
No	382	234 (61.3)	148 (38.7)	0.6	0.3, 1.1	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable	
		Healthcare Utilization <3 visits in past 12 months n (%)*	Healthcare Utilization ≥3 visits in past 12 months n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Preoperative malignancy status [■]							
Possibly malignant or Malignant	171	118 (69.0)	53 (31.0)	1.0	-	-	-
Not malignant	256	135 (52.7)	121 (47.3)	2.0	1.3, 3.0	-	n.s.
DEMOGRAPHIC & CLINICAL COVARIATES							
Age							
≥ 56 years	101	81 (80.2)	20 (19.8)	1.0	-	-	-
45-55 years	168	109 (64.9)	59 (35.1)	2.2	1.2, 3.9	1.4	n.s.
18-44 years	160	63 (39.4)	97 (60.6)	6.2	3.5, 11.2	4.0	2.0, 8.0
Marital Status							
Single/Divorced/ Widowed	123	82 (66.7)	41 (33.3)	1.0	-	-	-
Married	306	171 (55.9)	135 (44.1)	1.6	1.0, 2.4	2.3	1.4, 3.9
Racial Heritage [^]							
Caucasian	399	242 (60.7)	157 (39.3)	1.0	-	-	-
Non-Caucasian	29	11 (37.9)	18 (62.1)	2.5	1.2, 5.5	-	n.s.

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable	
		Healthcare Utilization <3 visits in past 12 months n (%)*	Healthcare Utilization ≥3 visits in past 12 months n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Highest education grade achieved							
≤High school diploma	137	89 (65)	48 (35)	1.0	-		
> High school diploma	292	164 (56.2)	128 (43.8)	1.5	1.0, 2.2	-	n.s
Employment Status							
Not employed/retired /other	146	100 (68.5)	46 (31.5)	1.0	-	-	-
Employed full time or part time	283	153 (54.1)	130 (45.9)	1.8	1.2, 2.8	1.8	1.0, 3.0
Body Mass Index (kg/m ²)							
≤24.9	126	72 (28.5)	54 (30.7)	1.0	-		
25-29.9	126	74 (29.2)	52 (29.5)	0.9	0.6, 1.5	-	NA
≥30	177	107 (42.3)	70 (39.8)	0.9	0.5, 1.4	-	NA
Current Smoker							
Yes	90	56 (22.1)	34 (19.3)	1.0	-		
No	339	197 (77.9)	42 (80.7)	1.2	0.7, 1.9	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable	
		Healthcare Utilization <3 visits in past 12 months n (%)*	Healthcare Utilization ≥3 visits in past 12 months n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Previous Abdominal Surgery							
Yes	295	168 (67.2)	127 (72.6)	1.0	-		
No	130	82 (32.8)	48 (27.4)	0.8	0.5, 1.2	-	NA
PHYSICAL SYMPTOM - PAIN							
Pain Intensity and Interference were run separately in multivariable analysis due to measuring corresponding outcomes							
Pain Intensity (Average score from x4 BPI ① questions)							
≤3/10	298	216 (72.5)	82 (27.5)	1.0	-		
>3/10	131	37(28.2)	94 (71.8)	6.7	4.2, 10.6	6.6	4.0-10.9
Pain Interference (Average score from x7 BPI ① questions)							
≤3/10	294	215 (73.1)	79 (26.9)	1.0	-	-	-
>3/10	135	38 (28.1)	97 (71.9)	6.9	4.4, 11.0	6.7	4.0, 11.1

^ 1 participant missing
 • 2 participants missing
 ~ 7 participants missing

① Centre for Epidemiological Studies - Depression Scale
 *Values do not always equal 100% due to rounding
 n.s- Not significant
 NA- Not Applicable – not significant at bivariate analysis so not included in multivariable analysis

Waiting for Surgery: Pain & Psychological Symptoms

Table 4.4- Healthcare Utilization Emergency Room Visits in the Past 12 Months for Pain - Yes or No

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Emergency room visits in past 12 months - NO n (%)*	Emergency room visits in past 12 months - YES n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
SITUATIONAL FACTORS							
Adjusted Days Waited▪							
< 4 weeks	111	83 (74.8)	28 (25.2)	1.0	-	1.0	-
4-8 weeks	149	121 (81.2)	28 (18.8)	0.7	0.4, 1.2	0.5	n.s
> 8 weeks	169	151 (89.3)	18 (17.2)	0.4	0.2, 0.7	0.2	0.1, 0.5
PSYCHOLOGICAL FACTORS							
Trait Anxiety score ▪							
Low (20-44)	350	297 (84.9)	53 (15.1)	1.0	-	-	-
High (≥45)	77	57 (74.0)	20 (26.0)	2.0	1.1, 3.5	-	n.s
CES-D ① Depression Score							
Low (<16)	270	237 (87.8)	33 (12.2)	1.0	-	-	-
High (≥16)	159	118 (74.2)	41 (25.8)	2.5	1.5, 4.2	-	n.s

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Emergency room visits in past 12 months - NO n (%)*	Emergency room visits in past 12 months - YES n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
PHYSIOLOGICAL FACTORS - GYNAECOLOGICAL							
Current Menstruation Status							
Periods stopped surgically or naturally	173	147 (85.0)	26 (15.0)	1.0	-		
Periods not stopped or unsure	256	208 (81.2)	48 (18.8)	1.3	0.8, 2.2	-	NA
Currently taking Hormone Replacement Therapy							
Yes	23	20 (87.0)	3 (13.0)	1.0	-		
No	316	261 (82.6)	55 (17.4)	1.4	0.4, 4.9	-	NA

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable Analysis	
		Emergency room visits in past 12 months - NO n (%)*	Emergency room visits in past 12 months - YES n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Have taken Birth Control Pills in the past month [✓]							
Yes	40	33 (82.5)	7 (17.5)	1.0	-		
No	382	315 (82.5)	67 (17.5)	1.0	0.4, 2.4	-	NA
Malignancy Status							
▪ Possibly malignant or	171	144 (84.2)	27 (15.8)	1.0	-		
Malignant	256	209 (81.6)	47 (18.4)	1.2	0.7, 2.0	-	NA
Not malignant							
DEMOGRAPHIC & CLINICAL COVARIATES							
Age							
≥56 years	101	94 (93.1)	7 (6.9)	1.0	-	-	-
45-55 years	168	142 (84.5)	26 (15.5)	4.6	1.0, 5.9	1.9	n.s
18-44 years	160	119 (74.4)	41 (25.6)	2.5	2.0, 0.8	3.6	1.5, 9.0

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Emergency room visits in past 12 months - NO n (%)*	Emergency room visits in past 12 months - YES n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Marital Status							
Single/Divorced/ Widowed	123	101 (82.1)	22 (17.9)	1.0	-		
Married	306	254 (83.0)	52 (17.0)	0.9	0.5, 1.6	-	NA
Racial Heritage ^							
Caucasian	399	335 (84.0)	64 (16.0)	1.0	-		
Non-Caucasian	29	19 (65.5)	10 (34.5)	2.3	0.9,5.7	-	n.s
Highest education grade achieved							
≤High school diploma	137	123 (89.8)	14 (10.2)	1.0	-	-	-
> High school diploma	292	232 (79.5)	60 (20.5)	2.3	1.2, 4.2	2.3	1.2, 4.5

Waiting for Surgery: Pain & Psychological Symptoms

Variable	Total number of women	n=429		Bivariate Analysis		Multivariable Analysis	
		Emergency room visits in past 12 months - NO n (%)*	Emergency room visits in past 12 months - YES n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Employment Status							
Not employed/retired /other	146	125 (85.6)	21 (14.4)	1.0	-		
Employed full time or part time	283	230 (81.3)	53 (18.7)	1.4	0.8, 2.4	-	NA
Body Mass Index (kg/m ²)							
≤24.9	126	100 (28.2)	26 (35.1)	1.0	-		
25-29.9	126	104 (29.3)	22 (29.7)	0.9	0.6, 1.5	-	NA
≥30	177	151 (42.5)	26 (35.1)	0.9	0.5, 1.4	-	NA
Current Smoker							
Yes	90	84 (23.7)	6 (8.1)	-	-	-	-
No	339	271 (76.3)	68 (91.9)	3.5	1.5, 8.4	4.5	1.8, 11.3

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Emergency room visits in past 12 months - NO n (%)*	Emergency room visits in past 12 months - YES n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Previous Abdominal Surgery							
Yes	295	247 (70.2)	48 (16.3)	1.0	-		
No	130	105 (29.8)	25 (34.2)	0.8	0.5, 1.4	-	NA
PHYSICAL SYMPTOM - PAIN Pain Intensity & Interference were run separately in multivariable analysis due to measuring corresponding outcomes							
Pain Intensity (Average score from x4 BPI ① questions)							
≤3/10	298	260 (87.2)	38 (12.8)	1.0	-	1.0	-
>3/10	131	95 (72.5)	36 (27.5)	2.6	1.6, 4.3	2.3	1.3, 4.0

Waiting for Surgery: Pain & Psychological Symptoms

		n=429		Bivariate Analysis		Multivariable Analysis	
Variable	Total number of women	Emergency room visits in past 12 months - NO n (%)*	Emergency room visits in past 12 months - YES n (%)*	Odds Ratio	C.I.	Odds Ratio	C.I.
Pain Interference (Average score from x7 BPI ① questions)							
≤3/10	294	260 (88.4)	34 (11.6)	1.0	-	1.0	-
>3/10	135	95 (82.8)	40 (29.6)	3.2	1.9, 5.4	3.1	1.8, 5.5

^ 1 participant missing
 • 2 participants missing
 ~ 7 participants missing

① Centre for Epidemiological Studies - Depression Scale

*Values do not always equal 100% due to rounding

n.s- Not significant

NA- Not Applicable – not significant at bivariate analysis so not included in multivariable analysis

Chapter 5

Overview of Findings

The purpose of this research was to examine situational, psychological and physiological factors whilst examining levels of pain and the amount of healthcare utilization for pain in women waiting for gynaecological surgery. The conceptual framework that guided this study was based on the Theory of Unpleasant Symptoms and illustrates the concepts of the biopsychosocial approach to healthcare.

The overall aims of this study were to increase knowledge of psychological symptoms and pain in women and to gain a better understanding of the relationship between symptoms and healthcare utilization for pain in women waiting for gynaecological surgery.

The results were consistent with the theory in that situational, psychological and physiological factors had an effect on the level of symptom experience. Moderate to severe levels of pain (intensity & interference) were found to occur in one-third of the population and higher pain intensity and pain interference was demonstrated in women with high levels of depression, somatization and catastrophizing. Also, the performance of healthcare utilization for pain was carried out by over half of participants in the 12 months preceding gynaecological surgery. This study found healthcare utilization for pain was associated with higher pain intensity and interference, with younger women, pre or

Waiting for Surgery: Pain & Psychological Symptoms
peri-menopausal and also with high anxiety. These supplementary visits are recognized to be an additional expense on the healthcare service. The theory recognizes that this performance, healthcare utilization for pain, can subsequently have a feed-back effect on patients' situational, psychological and physiological state. The study did not measure the extent of this feed-back effect, but the author recognizes that the performance of healthcare utilization might itself impact the unpleasant factors and symptom of pain.

Psychological factors are recognized to be an important component of the pain experience (Turk & Okifuji, 2002) and our results showed that the women with elevated anxiety were found to utilize healthcare more frequently, but women with depression did not utilize more healthcare. When looking at the symptom of pain, elevated levels of intensity and interference were associated with depression, but not with high levels of anxiety. These results propose that anxiety and depression impact patients differently, yet both were shown to have an association with pain. This suggests a need for healthcare professionals to consider both anxiety and depression due to their potential affect on patients in the preoperative setting.

This study has also provided important recognition of a link between pain and somatization, and pain and catastrophizing in women waiting for gynaecological surgery. The results support literature on somatization having an association with pain (Lipowski, 1988; Sharpe & Mayou, 2004; Mai, 2004; Rubin, 2005). The SSST used to measure somatization proposes that the condition may exist for a number of women with 2 or more of the 7 symptoms present, however to diagnose somatization further medical

Waiting for Surgery: Pain & Psychological Symptoms

examination is required. The results are equally significant in demonstrating an association with catastrophizing and pain in women waiting for gynaecological surgery. The 2 question tool provides an indication of a patient's level of coping with pain, and acts as a red flag to healthcare professionals to highlight individuals who may require psychological support for pain management needs before surgery.

Strengths and Limitations

Limitations

A study limitation was the use of cross sectional data, therefore the direction of the causal link is not known, i.e. did higher levels of pain intensity or pain interference result from the individual psychological factors or did the high pain intensity and pain interference cause the psychological factors to be higher? Despite this uncertainty, it is apparent that both physical and psychological factors exist and healthcare practitioners need to be cognizant of the potential influence on patients prior to surgery. It was also unknown to what extent the women who declined to join the study suffered from physical and psychological characteristics and whether the women that enrolled were more interested because of a personal experience with pain. On the contrary, women with high levels of pain may not have felt well enough to complete the questionnaires prior to surgery. Therefore it is not known how this bias might affect the study. However, this study included a substantial population and a significant number of these women reported no pain intensity in the past week and 53% of the population reported experiencing pain. A prevalence study of pain carried out in the same locality of southeastern Ontario found

Waiting for Surgery: Pain & Psychological Symptoms

49% of the population reported chronic pain and 60% of the population experienced pain from a low to high degree (Tripp et al., 2006) which is similar to our result and therefore increases the likelihood that our study is representative of the preoperative gynaecological population.

Another limitation was the use of self-reported questionnaires, with no additional methods to corroborate information; however the prevalence of pain and pain characteristics all correlated with other studies within the literature. Another limitation is the self-reporting of healthcare utilization for pain over the previous 12 months, with a potential for recall bias impacting the data collected. A review of literature on recall bias regarding healthcare utilization found conflicting information between the accuracy of patient self-reports and medical records. Underreporting of healthcare utilization was recognized in cases where healthcare utilization is greater (Ritter et al., 2000 & Jordan et al., 2006); and patients with poorer health status were found to over report healthcare utilization (Jordan et al.). Recall bias might therefore exist in this study and need to be taken into consideration when interpreting the frequency of healthcare utilization for pain. The healthcare utilization recall for this study is specifically about pain visits. Participants might have incorrectly recalled healthcare utilization visits in general as well as the pain specific visits. It is known however that healthcare utilization is frequently related to pain, as recognized by Morely-Forster et al. who determined that in a 4 week period an average of 45 patients visited their family practitioners for moderate to severe pain (2003); Mantyselka et al. (2001) found 29% of visits to a family physician were

Waiting for Surgery: Pain & Psychological Symptoms because of pain and the Canadian Pain Consortium discovered 80% of all physician visits had a pain-related component (2001).

Study Attributes/Strengths

A review of the data highlighted that very few questions were unanswered by participants, therefore minimal missing data for the sample size increases the validity of the data collected. The sample size of 429 participants was sufficient to allow several variables to be included in the analysis and increased the probability of the sample being representative of gynaecological patients waiting for surgery. Furthermore this comprehensive data collection, allowing a variety of situational, psychological, physiological and demographic factors to be examined for each patient, were then controlled for within the statistical analysis and the significant variables were then highlighted.

Reporting of gynaecological, physical and psychological symptoms were all measured within a short time period, therefore diminishing the chance of recall bias. Also, the participants in this study consisted of a homogeneous population, with all women waiting to undergo gynaecological surgery. Having a population with similar characteristics will lower the variability of reporting which could occur in groups with different demographics.

Carrying out two separate data analyses in the creation of two manuscripts has allowed examination of the cross-sectional data from two perspectives, the outcome of healthcare utilization and the outcome of pain intensity and pain interference. Both these

Waiting for Surgery: Pain & Psychological Symptoms

studies have highlighted the importance of physical and psychological factors impacting patient's health status and healthcare use.

Implications and Future Recommendations

This study reinforces the need for nurses and other healthcare professionals to consider physical and psychological issues that affect patients prior to surgery, thus supporting the requirement for healthcare professionals to examine patients from a biopsychosocial perspective. Primary healthcare assessment is required to obtain information about a patients' physical and psychological state during the waiting period for surgery. Through recognizing areas of need, appropriate care can then be given. One recommendation would be to implement preoperative care pathways, with the aim of helping primary healthcare practitioners ensure appropriate care is provided early on, targeting issues and potentially reducing additional healthcare utilization. Implementing care-pathways requires consideration of the quantity and time required to carry out patient assessments, so as not to exacerbate the workload for healthcare providers. For this reason, one suggestion is for care-pathways to feature a concise pain assessment tool and short psychological assessment tools, such as the SSST for somatization and 2 question catastrophizing tool for the initial routine assessment; then using further physical and psychological assessment methods and interventions as necessary.

Managing factors that impact patients' experience prior to surgery, such as pain management and psychological interventions, can improve patients' health status. By reducing additional healthcare utilization this will decrease healthcare expenditure. Visits

Waiting for Surgery: Pain & Psychological Symptoms

to healthcare for pain were carried out by over half of the women in this study, in addition, a small number of participants reported pain but did not utilize healthcare for pain, and these women potentially have an unmet need. By targeting gynaecological patients waiting for surgery and enhancing their pain management, all gynaecological patients would benefit, regardless of their utilization of healthcare for pain.

Recommendations for understanding women's healthcare utilization were proposed by Kazanjian et al. (2004) and include the need for longitudinal studies to obtain a broader understanding of women's health issues. Such data is currently being gathered for the larger chronic post surgical pain study which provided the data for this study. Subsequent to the evidence provided by this current study, interventional studies could also be carried out, focusing on care provision in the primary healthcare setting, for example following implementation of care-pathways, patient education, pain management or psychological support, a study could assess patients health status prior to surgery and compare with this study's results to see if healthcare utilization rates are reduced.

In a struggling financial environment, the healthcare service needs to find ways to control expenses wherever possible. Women will continue to require surgical management of gynaecological conditions, and yet if enhancements can be made in the preoperative phase of care, there is opportunity to reduce expenses through improving physical and psychological status of patients. Through improving patient's health, the

Waiting for Surgery: Pain & Psychological Symptoms

benefits will not only impact the preoperative period, but could also minimize healthcare interventions throughout the surgical period and into the postoperative phase.

Appendix A
Questionnaires

Appendix: Brief Pain Inventory- long form

Brief Pain Inventory – long form

Date: / /

Name: _____

Last

First

Middle Initial

Phone: _(____)_____

Sex: Female Male

Date of Birth: ____/____/____

1) Marital Status (at present)

1. Single

3. Widowed

2. Married

4. Separated/Divorced

2) Education (Circle only the highest grade or degree completed)

Grade 0 1 2 3 4 5 6 7 8 9

10 11 12 13 14 15 16 M.A./M.S.

Professional degree (please specify) _____

3) Current Occupation _____

(Specify titles; if you are not working, tell us your previous occupation)

Waiting for Surgery: Pain & Psychological Symptoms

4) Spouse's Occupation _____

5) Which of the following best describes your current job status?

1. Employed outside the home, full-time
2. Employed outside the home, part-time
3. Homemaker
4. Retired
5. Unemployed
6. Other

6) How long has it been since you first learned your diagnosis? _____ months

7) Have you ever had pain due to your present disease?

1. Yes 2. No 3. Uncertain

8) When you first received your diagnosis, was pain one of your symptoms?

1. Yes 2. No 3. Uncertain

9) Have you had surgery in the past month? 1. Yes 2. No

If YES, what kind? _____

10) Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, toothaches). Have you had pain OTHER than these everyday kinds of pain during the PAST WEEK?

1. Yes 2. No

10a) Did you take pain medications in the last 7 days?

1. Yes 2. No

10b) I feel I have some form of pain now that requires medication each and every day.

1. Yes 2. No

Waiting for Surgery: Pain & Psychological Symptoms

18) What treatments or medications are you receiving for pain?

19) In the last week, how much relief have pain treatments or medications provided? Please circle the one percentage that most shows how much relief you have received.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
No relief Complete Relief

20) If you take pain medication, how many hours does it take before the pain returns?

- | | |
|--|--|
| 1. <input type="checkbox"/> <input type="checkbox"/> Pain medication doesn't help at all | 5. <input type="checkbox"/> <input type="checkbox"/> Four hours |
| 2. <input type="checkbox"/> <input type="checkbox"/> One hour | 6. <input type="checkbox"/> <input type="checkbox"/> Five to twelve hours |
| 3. <input type="checkbox"/> <input type="checkbox"/> Two hours | 7. <input type="checkbox"/> <input type="checkbox"/> More than twelve hours |
| 4. <input type="checkbox"/> <input type="checkbox"/> Three hours | 8. <input type="checkbox"/> <input type="checkbox"/> I do not take pain medication |

21) Check the appropriate answer for each item.

I believe my pain is due to:

- Yes No 1. The effects of treatment (for example, medication, surgery, radiation, prosthetic device).
- Yes No 2. My primary disease (meaning the disease currently being treated and evaluated)
- Yes No 3. A medical condition unrelated to my primary disease (for example, arthritis).

Please describe condition: _____

22) For each of the following words, check Yes or No if that adjective applies to your pain.

Aching	<input type="checkbox"/> <input type="checkbox"/> Yes	<input type="checkbox"/> <input type="checkbox"/> No
Throbbing	<input type="checkbox"/> <input type="checkbox"/> Yes	<input type="checkbox"/> <input type="checkbox"/> No

Waiting for Surgery: Pain & Psychological Symptoms

C. Walking Ability

0	1	2	3	4	5	6	7	8	9	10
Does not										Completely
Interfere										interferes

D. Normal Work (includes both work outside the home and housework)

0	1	2	3	4	5	6	7	8	9	10
Does not										Completely
Interfere										interferes

E. Relations with other people

0	1	2	3	4	5	6	7	8	9	10
Does not										Completely
Interfere										interferes

F. Sleep

0	1	2	3	4	5	6	7	8	9	10
Does not										Completely
Interfere										interferes

G. Enjoyment of life

0	1	2	3	4	5	6	7	8	9	10
Does not										Completely
Interfere										interferes

Waiting for Surgery: Pain & Psychological Symptoms

24) I prefer to take my pain medicine:

1. On a regular basis
2. Only when necessary
3. Do not take pain medicine

25) I take my pain medicine (in a 24 hour period):

- | | |
|---|--|
| 1. <input type="checkbox"/> <input type="checkbox"/> Not every day | 4. <input type="checkbox"/> <input type="checkbox"/> 5 to 6 times per day |
| 2. <input type="checkbox"/> <input type="checkbox"/> 1 to 2 times per day | 5. <input type="checkbox"/> <input type="checkbox"/> More than 6 times per day |
| 3. <input type="checkbox"/> <input type="checkbox"/> 3 to 4 times per day | |

26) Do you feel you need a stronger type of pain medication?

- | | | |
|--|---|--|
| 1. <input type="checkbox"/> <input type="checkbox"/> Yes | 2. <input type="checkbox"/> <input type="checkbox"/> No | 3. <input type="checkbox"/> <input type="checkbox"/> Uncertain |
|--|---|--|

27) Do you feel you need to take more of the pain medication than your doctor has prescribed?

- | | | |
|--|---|--|
| 1. <input type="checkbox"/> <input type="checkbox"/> Yes | 2. <input type="checkbox"/> <input type="checkbox"/> No | 3. <input type="checkbox"/> <input type="checkbox"/> Uncertain |
|--|---|--|

28) Are you concerned that you use too much pain medication?

- | | | |
|--|---|--|
| 1. <input type="checkbox"/> <input type="checkbox"/> Yes | 2. <input type="checkbox"/> <input type="checkbox"/> No | 3. <input type="checkbox"/> <input type="checkbox"/> Uncertain |
|--|---|--|

If Yes, why? _____

Waiting for Surgery: Pain & Psychological Symptoms

29) Are you having problems with side effects from your pain medication?

1. Yes

2. No

Which side effects? _____

30) Do you feel you need to receive further information about your pain medication?

1. Yes

2. No

31) Other methods I use to relieve my pain include: (Please check all that apply)

Warm compresses

Cold compresses

Relaxation techniques

Distraction

Biofeedback

Hypnosis

Other

Please Specify _____

32) Medications not prescribed by my doctor that I take for pain are:

Waiting for Surgery: Pain & Psychological Symptoms

Appendix: Center for Epidemiological Studies Depression Scale

Center for Epidemiological Studies Depression Scale

Please circle the number which best describes how often you felt or behaved this way – DURING THE PAST WEEK

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
DURING THE PAST WEEK:				
1. I was bothered by things that usually don't bother me.	0	1	2	3
2. I did not feel like eating; my appetite was poor.	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family and friends.	0	1	2	3
4. I felt that I was just as good as other people.	0	1	2	3
5. I had trouble keeping my mind on what I was doing.	0	1	2	3

Waiting for Surgery: Pain & Psychological Symptoms

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
8. I felt hopeful about the future.	0	1	2	3
9. I thought my life had been a failure.	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	0	1	2	3
13. I talked less than usual.	0	1	2	3
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	0	1	2	3
17. I had crying spells.	0	1	2	3

Waiting for Surgery: Pain & Psychological Symptoms

18. I felt sad.	0	1	2	3
19. I felt that people disliked me.	0	1	2	3
20. I could not get “going”.	0	1	2	3

Waiting for Surgery: Pain & Psychological Symptoms

Appendix: State Trait Anxiety Form

State Trait Anxiety Form

Self-Evaluation Form S

ID # _____

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statements to indicate how you feel *right now*, that is, *at this moment*. There are no wrong or right answers. Do not spend much time on any one statement but give the answer which seems to describe your present feelings best.

	Not at all	Somewhat	Moderately so	Very much so
a) I feel calm	1	2	3	4
b) I feel secure	1	2	3	4
c) I am tense	1	2	3	4
d) I feel strained.....	1	2	3	4
e) I am at ease	1	2	3	4
f) I feel upset	1	2	3	4
g) I am presently worrying over possible misfortunes	1	2	3	4
h) I feel satisfied.....	1	2	3	4
i) I feel frightened	1	2	3	4
j) I feel comfortable.....	1	2	3	4
k) I feel self-confident.....	1	2	3	4
l) I feel nervous.....	1	2	3	4
m) I feel jittery.....	1	2	3	4

Waiting for Surgery: Pain & Psychological Symptoms

	Not at all	Somewhat	Moderately so	Very much so
n) I feel indecisive.....	1	2	3	4
o) I am relaxed.....	1	2	3	4
p) I feel confident.....	1	2	3	4
q) I am worried.....	1	2	3	4
r) I feel confused.....	1	2	3	4
s) I feel steady.....	1	2	3	4
t) I feel pleasant.....	1	2	3	4

Self-Evaluation Form T

ID # _____

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statements to indicate how you *generally* feel.

	Not at all	Somewhat	Moderately so	Very much so
a) I feel pleasant.....	1	2	3	4
b) I feel nervous and restless	1	2	3	4
c) I feel satisfied with myself	1	2	3	4
d) I wish I could be as happy as others seem to be	1	2	3	4
e) I feel like a failure.....	1	2	3	4

Waiting for Surgery: Pain & Psychological Symptoms

	Not at all	Somewhat	Moderately so	Very much so
f) I worry too much over something that really doesn't matter	1	2	3	4
g) I am cool, calm and collected	1	2	3	4
h) I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
i) I feel rested	1	2	3	4
j) I am happy	1	2	3	4
k) I have disturbing thoughts.....	1	2	3	4
l) I lack self-confidence.....	1	2	3	4
m) I feel secure.....	1	2	3	4
n) I make decisions easily.....	1	2	3	4
o) I feel inadequate.....	1	2	3	4
p) I am content	1	2	3	4
q) Some unimportant thought runs through my mind and bothers me.....	1	2	3	4
r) I take disappointments so keenly that I can't put them out of my mind.....	1	2	3	4
s) I am a steady person.....	1	2	3	4
t) I get in a state of turmoil as I think over my recent concerns and interests.....	1	2	3	4

Waiting for Surgery: Pain & Psychological Symptoms
Appendix: Seven Symptom Screening Test
Seven Symptom Screening Test

For the following seven questions, please check the box for 'No' or 'Yes' as appropriate.

1. Have you ever had trouble breathing? Yes No

2. Have you ever had frequent trouble with menstrual cramps? Yes No

3. Have you ever had burning sensations in your sexual organs, mouth, or rectum? Yes No

4. Have you ever had difficulties swallowing or had an uncomfortable lump in your throat that stayed with you for at least an hour? Yes No

5. Have you ever found that you could not remember what you had been doing for hours or days at a time? Yes No

- If yes*, did this happen even though you had not been drinking or taking drugs? Yes No

6. Have you ever had trouble from frequent vomiting? Yes No

7. Have you ever had frequent pain in your fingers or toes? Yes No

Appendix B

Wait Time Strategy Priority Scores

WAIT TIME STRATEGY
Better Access to Care

**Gynaecologic Surgery
Adult - Priority Assessment Tool**

Priority	Descriptions	Access Target
1	<ul style="list-style-type: none"> • Immediate – emergency surgery required 	Within 24 hours
2	<ul style="list-style-type: none"> • Constant, frequent or severe pain/symptoms (biological, psychological) • Significantly impacts ability to perform usual activities • High probability of disease progression with morbidity that might affect function or life expectancy • Recurring unscheduled visits i.e. ED/primary care physician/surgeon 	Within 4 weeks
3	<ul style="list-style-type: none"> • Moderate pain/symptoms (biological, psychological) • Moderately impacts ability to perform usual activities • Moderate probability of disease progression with morbidity that might affect function or life expectancy • Minimal unscheduled visits i.e. ED/primary care physician/surgeon 	Within 12 weeks
4	<ul style="list-style-type: none"> • Elective indication for surgery • Mild/occasional pain symptoms (biological, psychological) • Minimally impacts ability to perform usual activities • Minimal risk of morbidity incurred by waiting 	Within 26 weeks

References

Allen R.R. (Ed.) (1990) *The Concise Oxford Dictionary of Current English* (8th ed.).

Clarendon Press, Oxford.

Andrasik, F., Flor, H., & Turk, D. C. (2005). An expanded view of psychological aspects in head pain: The biopsychosocial model. *Neurological Sciences*, 26(Suppl 2), s87-91.

Armstrong, T. S. (2003). Symptoms experience: A concept analysis. *Oncology*

NursingForum.Online, 30(4), 601-606.

Bair, M. J., Robinson, R. L., Katon, W., & Kroenke, K. (2003). Depression and pain

comorbidity: A literature review.[see comment]. *Archives of Internal Medicine*,

163(20), 2433-2445.

Barsky, A. J., Orav, E. J., & Bates, D. W. (2006). Distinctive patterns of medical care

utilization in patients who somatize. *Medical Care*, 44(9), 803-811.

British Columbia Medical Association (BCMA) & Canadian Medical Association

(CMA) 2006. *The Economic Cost of Wait Times in Canada* Retrieved September

19th 2009, from http://www.bcma.org/files/Economic_cost_of_wait_times.pdf

Waiting for Surgery: Pain & Psychological Symptoms

- Beekman, A. T., Deeg, D. J., Van Limbeek, J., Braam, A. W., De Vries, M. Z., & Van Tilburg, W. (1997). Criterion validity of the center for epidemiologic studies depression scale (CES-D): Results from a community-based sample of older subjects in the netherlands. *Psychological Medicine*, 27(1), 231-235.
- Blyth, F. M., March, L. M., Brnabic, A. J., Jorm, L. R., Williamson, M., & Cousins, M. J. (2001). Chronic pain in australia: A prevalence study. *Pain*, 89(2-3), 127-134.
- Braybrooke, J., Ahn, H., Gallant, A., Ford, M., Bronstein, Y., Finkelstein, J., et al. (2007). The impact of surgical wait time on patient-based outcomes in posterior lumbar spinal surgery. *European Spine Journal*, 16(11), 1832-1839.
- Canadian Institute for Health Information (2006) *Waiting for Healthcare in Canada: What We Know and What We Don't Know*. Retrieved August 25th 2009, from http://secure.cihi.ca/cihiweb/products/WaitTimesReport_06_e.pdf
- Canadian Medical Association (2008) *The Economic Cost of Wait Times in Canada 2008* Retrieved August 25th 2009, from http://www.cma.ca/multimedia/CMA/Content/Images/Inside_cma/Media_Releases/pdf/2008/EconomicReport.pdf
- Canadian Pain Consortium (2001). Canadian Consortium on Pain Mechanism Diagnosis and Management. <http://www.curepain.ca/final.htm> Last retrieved November 2nd 2006. Unable to access link August 25th 2009.

Waiting for Surgery: Pain & Psychological Symptoms

- Carr, E., Brockbank, K., Allen, S., & Strike, P. (2006). Patterns and frequency of anxiety in women undergoing gynaecological surgery. *Journal of Clinical Nursing, 15*(3), 341-352.
- Carr, E. C., Nicky, T. V., & Wilson-Barnet, J. (2005). Patient experiences of anxiety, depression and acute pain after surgery: A longitudinal perspective. *International Journal of Nursing Studies, 42*(5), 521-530.
- Chrubasik, S., Junck, H., Zappe, H. A., & Stutzke, O. (1998). A survey on pain complaints and health care utilization in a German population sample. *European Journal of Anaesthesiology, 15*(4), 397-408.
- Curtis, K. M., Hillis, S. D., Kieke Jr, B. A., Brett, K. M., Marchbanks, P. A., & Peterson, H. B. (1998). Visits to emergency departments for gynecologic disorders in the United States, 1992-1994. *Obstetrics and Gynecology, 91*(6), 1007-1012.
- Daut, R. L., Cleeland, C. S., & Flanery, R. C. (1983). Development of the Wisconsin brief pain questionnaire to assess pain in cancer and other diseases. *Pain, 17*(2), 197-210.
- De Gucht, V., & Fischler, B. (2002). Somatization: A critical review of conceptual and methodological issues. *Psychosomatics: Journal of Consultation Liaison Psychiatry, 43*(1), 1-9.

Waiting for Surgery: Pain & Psychological Symptoms

- Derrett, S., Paul, C., & Morris, J. M. (1999). Waiting for elective surgery: Effects on health-related quality of life. *International Journal for Quality in Health Care*, *11*(1), 47-57.
- Durand, V.M., Barlow, D.H., & Stewart, S, H. (2008) *Essentials of abnormal psychology* (p178) Thomson: Australia.
- Ell, K., Sanchez, K., Vourlekis, B., Lee, P. J., Dwight-Johnson, M., Lagomasino, I., et al. (2005). Depression, correlates of depression, and receipt of depression care among low-income women with breast or gynecologic cancer. *Journal of Clinical Oncology*, *23*(13), 3052-3060.
- Esmail, N., Hazel, M. & Walker, M.A. (2008) Waiting Your Turn Hospital Waiting Lists in Canada 2008 Report - Health Care Policy p 1-145. Retrieved August 25th 2009 from www.fraserinstitute.org/researchandpublications/publications/6240.aspx
- Fink, P., Sorensen, L., Engberg, M., Holm, M., & Munk-Jorgensen, P. (1999). Somatization in primary care. prevalence, health care utilization, and general practitioner recognition. *Psychosomatics*, *40*(4), 330-338.
- Fogarty, C., & Cronin, P. (2008). Waiting for healthcare: A concept analysis. *Journal of Advanced Nursing*, *61*(4), 463-471.

Waiting for Surgery: Pain & Psychological Symptoms

- Garcia-Cebrian, A., Gandhi, P., Demyttenaere, K., & Peveler, R. (2006). The association of depression and painful physical symptoms--a review of the european literature. *European Psychiatry: The Journal of the Association of European Psychiatrists*, 21(6), 379-388.
- Gatchel, R. J., & Theodore, B. R. (2008). Evidence-based outcomes in pain research and clinical practice. *Pain Practice*, 8(6), 452-460.
- Goodman, G.R. (2003) Outcomes measurement in pain management issues of disease complexity and uncertain outcomes. *Journal of Nursing Care Quality* 18 (2), 105-111.
- Grace, V. M., & Zondervan, K. T. (2004). Chronic pelvic pain in new zealand: Prevalence, pain severity, diagnoses and use of the health services. *Australian & New Zealand Journal of Public Health*, 28(4), 369-375.
- Hartmann, K. E., Ma, C., Lamvu, G. M., Langenberg, P. W., Steege, J. F., & Kjerulff, K. H. (2004). Quality of life and sexual function after hysterectomy in women with preoperative pain and depression. *Obstetrics & Gynecology*, 104(4), 701-709.
- Hilkuysen, G. L., Oudhoff, J. P., Rietberg, M., van der Wal, G., & Timmermans, D. R. (2005). Waiting for elective surgery: A qualitative analysis and conceptual framework of the consequences of delay. *Public Health*, 119(4), 290-293.

Waiting for Surgery: Pain & Psychological Symptoms

- Holtan, A., & Kongsgaard U.E. (2009) The use of pain descriptors in cancer patients. *Journal of Pain and Symptom Management*, 38 (2), 208-215.
- Huth, M. M., & Broome, M. E. (2007). A snapshot of children's postoperative tonsillectomy outcomes at home. *Journal for Specialists in Pediatric Nursing: JSPN*, 12(3), 186-195.
- International Association for the study of Pain (IASP) (2007) Retrieved August 25th 2009 from http://www.iasp-pain.org/AM/Template.cfm?Section=Pain_Definitions&Template=/CM/HTMLDisplay.cfm&ContentID=1728
- Irvin, S. K. (2001). Waiting: Concept analysis. *Nursing Diagnosis*, 12(4), 128-136.
- Jalowiec, A., Grady, K. L., & White-Williams, C. (1994). Stressors in patients awaiting a heart transplant. *Behavioural Medicine*, 19(4), 145-154.
- Janzen, J. A., & Hadjistavropoulos, H. D. (2008). Examination of negative affective responses to waiting for surgery. *Canadian Journal of Nursing Research*, 40(4), 72-91.
- Jensen, M. P., Keefe, F. J., Lefebvre, J. C., Romano, J. M., & Turner, J. A. (2003). One and two-item measures of pain beliefs and coping strategies. *Pain*, 104(3), 453-469.

Waiting for Surgery: Pain & Psychological Symptoms

Joint Commission for Accreditation of Healthcare Organization (JCAHO) standards

(2001). Retrieved August 25th 2009 from

http://www.jointcommission.org/NewsRoom/health_care_issues.htm

Jónsdóttir, H., & Baldursdóttir, L. (1998). The experience of people awaiting coronary artery bypass graft surgery: The icelandic experience. *Journal of Advanced Nursing, 27*(1), 68-74.

Jordan, K., Jinks, C., & Croft, P. (2006). Health care utilization: Measurement using primary care records and patient recall both showed bias. *Journal of Clinical Epidemiology, 59*(8), 791-797.

Katona, C., Peveler, R., Dowrick, C., Wessely, S., Feinmann, C., Gask, L., et al. (2005). Pain symptoms in depression: Definition and clinical significance. *Clinical Medicine, 5*(4), 390-395.

Kain, Z. N., Sevarino, F., Alexander, G. M., Pincus, S., & Mayes, L. C. (2000). Preoperative anxiety and postoperative pain in women undergoing hysterectomy. A repeated-measures design. *Journal of Psychosomatic Research, 49*(6), 417-422.

Kazanjian, A., Morettin, D. and Cho, R. (2004) Health Canada Healthcare utilization by Canadian Women Canadian Institute for Health Information. Retrieved August 25th 2009, from http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=AR_342_E

Waiting for Surgery: Pain & Psychological Symptoms

KGH (2009) Kingston General Hospital Website Retrieved August 25th from

<http://www.kgh.on.ca/about/about.asp>

Kirmayer, L. J., & Robbins, J. M. (1991). Three forms of somatization in primary care:

Prevalence, co-occurrence, and sociodemographic characteristics. *Journal of Nervous & Mental Disease, 179*(11), 647-655.

Kjerulff, K. H., Frick, K. D., Rhoades, J. A., & Hollenbeak, C. S. (2007). The cost of being a woman: A national study of health care utilization and expenditures for female-specific conditions. *Womens Health Issues, 17*(1), 13-21.

Knapp, D. A., & Koch, H. (1984). The management of new pain in office-based ambulatory care: National ambulatory medical care survey, 1980 and 1981. *Advance Data, (97)*, 1-9.

Lathe, P., Lathe, M., Say, L., Gulmezoglu, M., & Khan, K. S. (2006). WHO systematic review of prevalence of chronic pelvic pain: A neglected reproductive health morbidity. *BMC Public Health, 6*, 177.

Lazarus, R.S. & Folkman, S. (1984) *Stress, Appraisal and Coping*. (p21). New York: Springer.

Lenz, E. R., Pugh, L. C., Milligan, R. A., Gift, A., & Suppe, F. (1997). The middle-range theory of unpleasant symptoms: An update. *Advances in Nursing Science, 19*(3), 14-27.

Waiting for Surgery: Pain & Psychological Symptoms

- Lenz, E. R., Suppe, F., Gift, A. G., Pugh, L. C., & Miligan, R. A. (1995). Collaborative development of middle-range nursing theories: Toward a theory of unpleasant symptoms. *Advances in Nursing Science. Theory and Knowledge Development*, 17(3), 1-13.
- Levey, J. A., & Larson, J. E. (1996). Clinical relevance of presenting symptoms in the preoperative evaluation of pelvic masses. *Delaware Medical Journal*, 68(7), 345-348.
- Lin, L. Y., & Wang, R. H. (2005). Abdominal surgery, pain and anxiety: Preoperative nursing intervention. *Journal of Advanced Nursing*, 51(3), 252-260.
- Lindberg, C. E., & Nolan, L. B. (2001). Women's decision making regarding hysterectomy. *JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 30(6), 607-616.
- Linton, S.J. (2005) Early interventions: a cognitive-behavioural approach. In Tjoa, E., Law, M. & Kenner, H. (Eds.), *Understanding pain for better clinical practice a psychological perspective* (pp123-139). Edinburgh: Elsevier.
- Lipowski, Z. J. (1988). Somatization: The concept and its clinical application. *American Journal of Psychiatry*, 145(11), 1358-1368.

Waiting for Surgery: Pain & Psychological Symptoms

- Lose, G. (2005). The burden of stress urinary incontinence. *European Urology Supplements* 4 5-10.
- Lumsden, M. A., West, C. P., Thomas, E., Coutts, J., Hillier, H., Thomas, N., et al. (1994). Treatment with the gonadotrophin releasing hormone-agonist goserelin before hysterectomy for uterine fibroids. *British Journal of Obstetrics & Gynaecology*, 101(5), 438-442.
- Magni, G., Moreschi, C., Rigatti-Luchini, S., & Merskey, H. (1994). Prospective study on the relationship between depressive symptoms and chronic musculoskeletal pain. *Pain*, 56(3), 289-297.
- Mai, F. (2004). Somatization disorder: A practical review. [see comment]. *Canadian Journal of Psychiatry - Revue Canadienne De Psychiatrie*, 49(10), 652-662.
- Mantyselka, P., Kumpusalo, E., Ahonen, R., Kumpusalo, A., Kauhanen, J., Viinamaki, H., et al. (2001). Pain as a reason to visit the doctor: A study in finnish primary health care. *Pain*, 89(2-3), 175-180.
- Martin, D. C. (2006). Hysterectomy for treatment of pain associated with endometriosis. *Journal of Minimally Invasive Gynecology*, 13(6), 566-572.
- Martorella, G., Cote, J., & Choiniere, M. (2008). Pain catastrophizing: A dimensional concept analysis. *Journal of Advanced Nursing*, 63(4), 417-426.

Waiting for Surgery: Pain & Psychological Symptoms

MBF Foundation (2007) The high price of pain: the economic impact of persistent pain in

Australia, MBF Foundation in collaboration with University of Sydney Pain

Management Research Institute. Retrieved August 25th 2009 from

http://www.mbf.com.au/MBF/About%20MBF/Forms/MBF_Foundation_the_price_of_pain.pdf

McCann, K., & Boore, J. R. (2000). Fatigue in persons with renal failure who require maintenance haemodialysis. *Journal of Advanced Nursing*, 32(5), 1132-1142.

McClish, D. K., Levenson, J. L., Penberthy, L. T., Roseff, S. D., Bovbjerg, V. E., Roberts, J. D., et al. (2006). Gender differences in pain and healthcare utilization for adult sickle cell patients: The PiSCES project. *Journal of Women's Health*, 15(2), 146-154.

Morley-Forster, P. K., Clark, A. J., Speechley, M., & Moulin, D. E. (2003). Attitudes toward opioid use for chronic pain: A canadian physician survey. *Pain Research & Management*, 8(4), 189-194.

Morrison, J. (1995). Somatization disorder 300.81. *DSM-IV made easy - the clinician's guide to diagnosis* (pp. 294-295). New York: The Guildford Press.

Myers, J. K., & Weissman, M. M. (1980). Use of a self-report symptom scale to detect depression in a community sample. *American Journal of Psychiatry*, 137(9), 1081-1084.

Newton, J. R., & Reading, A. E. (1980). An analysis of the intensity and quality of gynecological pain. *Acta Obstetrica Et Gynecologica Scandinavica*, 59(2), 143-148.

Waiting for Surgery: Pain & Psychological Symptoms

- Northrup, C. (2006) *Women's bodies, women's wisdom: creating physical and emotional health and healing* (p559). New York, New York: Bantam Dell.
- Othmer, E., & DeSouza, C. (1985). A screening test for somatization disorder (hysteria). *American Journal of Psychiatry*, *142*(10), 1146-1149.
- Oudhoff, J. P., Timmermans, D. R., Bijnen, A. B., & van der Wal, G. (2004). Waiting for elective general surgery: Physical, psychological and social consequences. *ANZ Journal of Surgery*, *74*(5), 361-367.
- Oudhoff, J. P., Timmermans, D. R., Knol, D. L., Bijnen, A. B., & van der Wal, G. (2007). Waiting for elective general surgery: Impact on health related quality of life and psychosocial consequences. *BMC Public Health*, *7*, 164.
- Persson, P., Wijma, K., Hammar, M., & Kjolhede, P. (2006). Psychological wellbeing after laparoscopic and abdominal hysterectomy--a randomized controlled multicentre study. *BJOG: An International Journal of Obstetrics & Gynaecology*, *113*(9), 1023-1030.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*(3), 385-401
- Rannestad, T., Eikeland, O., Helland, H., & Qvarnstrom, U. (2001). Are the physiologically and psychosocially based symptoms in women suffering from gynecological disorders alleviated by means of hysterectomy? *Journal of Women's Health & Gender-Based Medicine*, *10*(6), 579-587.

Waiting for Surgery: Pain & Psychological Symptoms

- Ray, J. J. (1984). Measuring trait anxiety in general population samples. *Journal of Social Psychology, 123*(2D Half), 189-193.
- Reishtein, J. L. (2005). Relationship between symptoms and functional performance in COPD. *Research in Nursing & Health, 28*(1), 39-47.
- Ritter, P. L., Stewart, A. L., Kaymaz, H., Sobel, D. S., Block, D. A., & Lorig, K. R. (2001). Self-reports of health care utilization compared to provider records. *Journal of Clinical Epidemiology, 54*(2), 136-141.
- Rohrer, J. E., Merry, S. P., Adamson, S. C., & Barnes, D. E. (2008). General pain and frequency of medical visits in family medicine: A retrospective analysis of medical records. *Disease Management & Health Outcomes, 16*(1), 47-52.
- Rosenstiel, A. K., & Keefe, F. J. (1983). The use of coping strategies in chronic low back pain patients: Relationship to patient characteristics and current adjustment. *Pain, 17*(1), 33-44.
- Rubin, J.J. (2005) Psychosomatic pain: new insights and management strategies. *Southern Medical Journal 98*(11), 1099-1109.
- Saleh, K.J, Wood K, Gafni, A, Gross, A. (1997). Immediate surgery versus waiting list policy in revision total hip arthroplasty, an economic evaluation. *Journal of Arthroplasty; 12*:1-10.

Waiting for Surgery: Pain & Psychological Symptoms

- Sharpe, M. & Mayou, R. (2004). Somatoform disorders: a help or hindrance to good patient care? *The British Journal of Psychiatry*, (184), 465-467.
- Shrout, P. E., & Yager, T. J. (1989). Reliability and validity of screening scales: Effect of reducing scale length. *Journal of Clinical Epidemiology*, 42(1), 69-78.
- Statistics Canada (2006). *Access to Health Care Services in Canada: January to December 2005*. Catalogue No. 82-575-XIE. Statistics Canada. Retrieved November 14, 2008 from <http://dsp-psd.tpsgc.gc.ca/Collection/Statcan/82-575-X/82-575-XIE2006002.pdf>
- Stewart, M. W., Harvey, S. T., & Evans, I. M. (2001). Coping and catastrophizing in chronic pain: A psychometric analysis and comparison of two measures. *Journal of Clinical Psychology*, 57(1), 131-138.
- Stovall, T. G., Ling, F. W., & Crawford, D. A. (1990). Hysterectomy for chronic pelvic pain of presumed uterine etiology. *Obstetrics & Gynecology*, 75(4), 676-679.
- Subocz, E. G., VanDenKerkhof, E. G., Hopman, W. M., Towheed, T. E., Goldstein, D.H, Wilson, R. A., et al. (2007) A pilot study assessing pain and health-related quality of life in women after cesarean section. Unpublished Master's thesis. School of Nursing, Queen's University, Kingston, Ontario, Canada.
- Sullivan, M.J.L., Tripp, D.A. & Santor, D. (2000) Gender differences in pain and pain behavior: the role of catastrophizing. *Cognitive Therapy and Research* 24 (1), 121-134.

Waiting for Surgery: Pain & Psychological Symptoms

- Sullivan, M. J., & D'Eon, J. L. (1990). Relation between catastrophizing and depression in chronic pain patients. *Journal of Abnormal Psychology, 99*(3), 260-263.
- Sundström, I. M. E., Bixo, M., Björn, I., & Åström, M. Prevalence of psychiatric disorders in gynecologic outpatients. *American Journal of Obstetrics and Gynecology, 184*(2), 8-13.
- Tan, G., Jensen, M. P., Thornby, J. I., & Shanti, B. F. (2004). Validation of the brief pain inventory for chronic nonmalignant pain. *Journal of Pain, 5*(2), 133-137.
- Tesch, R. S., Denardin, O. V., Baptista, C. A., & Dias, F. L. (2004). Depression levels in chronic orofacial pain patients: A pilot study. *Journal of Oral Rehabilitation, 31*(10), 926-932.
- Thornton, E. W., McQueen, C., Rosser, R., Kneale, T., & Dixon, K. (1997). A prospective study of changes in negative mood states of women undergoing surgical hysterectomy: The relationship to cognitive predisposition and familial support. *Journal of Psychosomatic Obstetrics & Gynecology, 18*(1), 22-30.
- Triffaux, J. M., Wauthy, J., Bertrand, J., Limet, R., Albert, A., & Ansseau, M. (2001). Psychological evolution and assessment in patients undergoing orthotopic heart transplantation. *European Psychiatry: The Journal of the Association of European Psychiatrists, 16*(3), 180-185.

Waiting for Surgery: Pain & Psychological Symptoms

- Tripp, D. A., VanDenKerkhof, E. G., & McAlister, M. (2006). Prevalence and determinants of pain and pain-related disability in urban and rural settings in southeastern ontario. *Pain Research & Management, 11*(4), 225-233.
- Turk, D.C. & Melzack, R. (Eds.). (2001) *Handbook of pain assessment* (p4). New York: The Guildford Press.
- Turk, D.C., & Okifuji, A. (2002). Psychological factors in chronic pain: evolution and revolution. *Journal of Consulting and Clinical Psychology, 70*(3), 678-690.
- Turner, J. A., Jensen, M. P., Warm, C. A., & Cardenas, D. D. (2002). Catastrophizing is associated with pain intensity, psychological distress, and pain-related disability among individuals with chronic pain after spinal cord injury. *Pain, 98*(1-2), 127-134.
- VanDenKerkhof, E. G., Hopman, W. M., Towheed, T., Wilson, R., Murdoch, J., Rimmer, M., et al. (2006). Pain, health-related quality of life and health care utilization after inpatient surgery: A pilot study. *Pain Research & Management, 11*(1), 41-47.
- Von Korff, M. & Dunn, K.M. (2008) Chronic pain reconsidered. *Pain 138*, 267-276.
- Von Korff, M., Lin, E. H., Fenton, J. J., & Saunders, K. (2007). Frequency and priority of pain patients' health care use. *Clinical Journal of Pain, 23*(5), 400-408.

Waiting for Surgery: Pain & Psychological Symptoms

Waddell J.P. & Warnock G.L. (2008) Improving waiting times for surgery. *Canadian Journal of Surgery* 51 (5), 333-334.

Wait Time Strategy (2004) Retrieved August 25th 2009, from

http://www.health.gov.on.ca/transformation/wait_times/providers/strategy/wt_strategy_overview.pdf

Wait Time Strategy (2008) Practical Guide for Clinicians – The Tools and Information to Track Wait Times. Version 3.0 and Gynaecological Surgery Practical Guidelines for Clinicians v1.

Weber, A. M., Walters, M. D., Schover, L. R., Church, J. M., & Piedmonte, M. R.

(1999). Functional outcomes and satisfaction after abdominal hysterectomy.

American Journal of Obstetrics & Gynecology, 181(3), 530-535.

World Health organization (WHO) (2001) Anxiety definition. Retrieved August 25th

2009 from <http://www.emro.who.int/MNH/WHD/PublicInformation-Part6.htm>

World Health organization (WHO) Body Mass Index classification (copyright 2006)

http://apps.who.int/bmi/index.jsp?introPage=intro_3.html Retrieved August 25th 2009

World Health organization (WHO) (2008) Depression definition. Retrieved August 25th

2009, from <http://www.who.int/topics/depression/en/>

Waiting for Surgery: Pain & Psychological Symptoms

Zondervan, K. T., Yudkin, P. L., Vessey, M. P., Jenkinson, C. P., Dawes, M. G., Barlow, D. H., et al. (2001). The community prevalence of chronic pelvic pain in women and associated illness behaviour. *British Journal of General Practice*, 51(468), 541-547.