PAIN SELF-MANAGEMENT IN ADOLESCENTS: A PSYCHOSOCIAL APPROACH TO UNDERSTANDING THE ACQUISITION OF KNOWLEDGE, ATTITUDES AND BEHAVIORS

CENTRE FOR NEWFOUNDLAND STUDIES

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Pain self-management in adolescents: A psychosocial approach to understanding the acquisition of knowledge, attitudes and behaviors.

by

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Abstract

Objective: Adolescents independently self-medicate for a variety of recurrent pain types (e.g. muscle pain, headache, back pain and menstrual pain). Over-the-counter analgesic use is high among this age group and some research suggests that use is sometimes inappropriate and knowledge is poor. To date, no known research has specifically addressed how adolescents acquire attitudes about pain and pain management and how attitudes affect pain management practices. Two qualitative studies and one quantitative study were designed to address these questions.

Participants: Study 1 participants were 24 junior high school students from Halifax, Nova Scotia (11 male: $M = 13.45$ yrs, $SD = .93$, range = 12-15 yrs; 13 female: $M = 13.31$ yrs, $SD = .85$, range 12 - 15 yrs). Study 2 participants were 20 parent-adolescent dyads, from St. John's Newfoundland, composed of 20 mothers ($M = 42.72$ yrs, $SD = 5.42$, range 29 - 52 yrs), 10 male adolescents ($M = 13.6$ yrs, $SD = 1.43$, range 12 - 16 yrs) and 10 female adolescents ($M = 13.4$ yrs, $SD = 1.07$, range 12 - 15 yrs). Study 3 participants were also recruited in St. John's Newfoundland and consisted of 139 adolescents (50 male, $M = 14.24$ yrs, $SD = .89$ yrs, range = 13 - 16 years; 89 female, $M = 13.83$ yrs, $SD = .99$ yrs, range = 12 - 16 years,) and their parents (6 male, $M = 46$ yrs, SD = 2.61, range = 41 - 48 yrs; 133 female, $M = 41.85$ yrs, $SD = 3.26$ years, range = 34 - 50 yrs).

Method: Qualitative methods were used in both studies 1 and 2. Study 1 employed focus groups in order to determine pain and pain management issues relevant to adolescents, with a focus on peer influences. Study 2 employed semi-structured face-to-face interviews with parent-child dyads in order to determine the parental influences on pain and pain management attitudes and practices. Study 3 employed a survey method

delivered via telephone. Adolescent-parent dyads were recruited for studies 2 and 3 in order to assess direct links in attitude and practice, providing evidence for the intergenerational transmission of pain-related attitudes and behaviors.

Main Outcome Measures: Demographic data were collected from all participants in all three studies (e.g. age, grade, pain type, frequency, intensity, treatment choice) using the Pain Incident Questionnaire. These data were subject to descriptive data analysis. For studies 1 and 2, primary outcome measures were the textual data from focus group and interview sessions. Qualitative content analysis was used to reduce textual data to the central themes that emerged most prominently from focus group and interview sessions. For study 3, the Pain Management Questionnaire was developed to assess pain occurrences (type, frequency and intensity), attitudes toward over-the-counter medications and knowledge about over-the-counter medications. An additional focus of Study 3 was to develop and assess a measurement tool assessing attitudes toward over-the-counter medications.

Results: Pain complaints reported by adolescents were mainly headache, muscle/joint ache, menstrual pain, sprains and short-term pain associated with acute episodes such as falls or bumps. For adolescents, peers were influential in the expression of pain; gender differences in children's socialization of appropriate pain responses are discussed. In the qualitative studies, mothers were particularly influential in transmitting information about pain and pain management through verbal communications and their own pain and pain management behaviors. Mothers emerged as essential facilitators of their children's independent pain management. The intergenerational transmission of information about

pain and pain management strategies was apparent in textual data, but less clear in quantitative data.

Conclusions: The findings from these studies provide a fuller understanding of the adolescent recurrent pain experience. How adolescents learn about, and develop attitudes toward pain, pain, pain behaviors and pain management strategies are presented in a socio-communications model that stresses the influence of peers and mothers. Contributions to the current pain literature as well as study limitations and future directions are discussed.

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CHAPTER 1

Background

1.1 Developmental Aspects of Adolescence

Adolescence is a time during which individuals experience significant biological, cognitive, psychological and social changes that facilitate the transition from child to adult (Lerner & Spanier, 1980). Biologically, adolescence is characterized by the onset of puberty and the associated rapid growth and hormone fluctuation that accommodate the adolescents' physical transition from child to adult. Cognitive development is also dramatically enhanced during adolescence. By age eleven years, children move from the Piagetian concrete-logical stage of cognitive development to the formal-logical stage of cognitive development. Formal-logical processes are characterized by the ability to think hypothetically, to use scientific reasoning, to speculate about possibilities as well as actualities and to think abstractly (Keating, 1991; Piaget, 1970). This differs largely from the concrete-logical processes whereby children can think logically in terms of the real and tangible, but are unable to formulate thoughts about vague conceptions or hypothetical possibilities (Piaget, 1970). From the psychological perspective, adolescents begin to explore the concepts of "self" and seek to determine who they are and who they will become. This is a time of self-exploration directed at determining an identity within one's social contexts (Erikson, 1968). It is during this time as well that adolescents begin to characterize themselves in terms that are more complex and abstract; personal beliefs and convictions become increasingly important in how adolescents see themselves (Harter, 1998).

Much of the research in adolescent psychosocial development deals with peer and family influences in the acquisition of risky or problem behaviors (e.g. smoking, drug abuse, sexual

promiscuity) or the familial conflicts that arise during pubertal changes, with less focus on the "normal" or more positive aspects of psychosocial development (Chassin, Presson, Montello, Sherman & McGrew, 1986; Laursen & Collins, 1994; Morgan & Grube, 1991; Paikoff & Brooks-Gunn, 1991). Certainly, adolescence is a time characterized by the acquisition of autonomy and individuation wherein less time is spent with parents and family and more time spent with peers (Josselson, 1980; Larson & Richards, 1991). This process toward self-identity and independence from parents is often characterized by the rejection of parental authority and increased commitment to friends, particularly for the support and approval previously sought from parents (Josselson, 1980). During adolescence then, parents no longer serve as the primary source for social values; the increased dependence on peers and additional influences of various media sources provide young people with additional information about attitudes, behaviors and social values – essential components in the development of self-identity (Connolly, White, Stevens & Burstein, 1987; McGrath & Craig, 1989).

1.2 Recurrent Pain in Adolescence

Amidst the myriad changes experienced during adolescence, young people also experience a variety of recurrent pains (Goodman & McGrath, 1991). The widely accepted definition of pain disseminated by the International Association for the Study of Pain (1979) reads as follows; "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage." Although this definition addresses the subjective experience of pain and the negative affect associated with the pain experience, it falls short of recognizing the complex interactions of genetic endowment, personal history, social parameters, psychological states and developmental status that occur in

conjunction with the tissue pathology (Craig, 2002). As adolescents' biological, cognitive and psychosocial development shifts dramatically during the transition from childhood to adulthood, so do their experiences with pain. Craig (2002) asserts that "...there are rapid transformations in the nature of the (pain) experience and in its expression through childhood and adolescence. These changes reflect rapid maturation of the biological substrates serving pain, emotion, cognition, language, behavioral competence and social interaction acting in conjunction with the powerful impact of life experiences...In consequence, any understanding of children's pain must be developmentally appropriate and sensitive to the social contexts of the infant, child or adolescent's life" (p. 305).

1.3 Pediatric Pain Research

Research addressing pediatric pain has been growing steadily over the past 20 years. The primary focus of this research has been (1) clinically significant acute pain associated with the onset of disease and medical procedures related to disease treatment and (2) chronic and recurrent pain related to disease, trauma, non-specific factors and emotional distress. Such research has made significant contributions to clinical practice and healthcare providers' assessment and management of pain in the pediatric patient; however, much remains unknown about the prevalence of various types of pain in children. Epidemiological studies and reviews of clinically significant and chronic pain yield prevalence reports of a wide variety of pain types such as arthritis, fybromyalgia, joint/muscle pain, abdominal pain, dysmenorrhea and headache; however exact prevalence rates have been difficult to determine as a result of questionable and restrictive measurement tools and non-representative samples (see Goodman & McGrath, 1991;

McGrath, 1999 for reviews). Moreover, children who experience mild or moderate pain on a seldom or occasional basis have largely been ignored in the literature (McGrath, 1999).

Where studies assessing clinically significant acute pain and chronic pain deal primarily with a clinical pediatric population, informative studies investigating everyday pain have addressed the salience of the pain experience for children experiencing minor painful incidents that do not meet the criteria for clinical significance. Such pain episodes that result from falls or collisions may not require medical attention, but rather can be managed by the individual or a caregiver. These pain episodes, nonetheless provide the child with important information about danger, pain expression and caregiver responsiveness (Fearon et al., 1996; von Baeyer, Baskerville & McGrath, 1998). The social feedback from these everyday pain episodes are only part of the complex interactions that occur among tissue trauma, genetic endowment, personal history, familial and cultural context, psychological state and developmental status that influence the pain experience, making it much more than merely a subjective response to tissue damage (Craig, 2002).

1.4 Summary and Study Objectives

The rationale behind the present research project is based largely on two major facts that have been supported widely in the adolescent development and pediatric pain literature. Firstly, adolescence is characterized by the desire to achieve independence and autonomy from parents and develop a self-identity that is defined, partly, by attitudes and beliefs. As adolescents make the transition from complete dependence on parents to independence, their reliance on peers for information about beliefs and behaviors becomes more pronounced. However, adolescents have had their entire lives influenced by the attitudes and beliefs of their parents, which will largely

influence the adolescents' own acquisition of attitudes and beliefs. Secondly, adolescents experience a variety of recurrent pains associated with, among other things, the onset of puberty (e.g. growing pains, menstrual pain). To date, the social context of the adolescents' pain experiences have been ignored. The existing literature indicates that adolescents shift toward autonomy across a range of health-related behaviors, including the decision to self-medicate for pain. However, the attitudes and beliefs that affect the decision to self-medicate and how these attitudes and beliefs are acquired within the rich social context of the adolescents' life have not been properly investigated.

The purpose of the present research is to (1) gain an understanding of adolescents' attitudes, beliefs and practices toward pain management (2) determine how they acquire these attitudes and (3) understand the full pain experience within the complex social contexts of the adolescents' life.

The following chapter (Chapter 2) addresses recurrent pain among adolescents with a review of the existing literature on pain prevalence, over-the-counter (OTC) medication use among adolescents, non-pharmacological pain management strategies employed by adolescents, gender differences in pain experiences, pain responses, knowledge of OTC medications for pain management, parental influences in pain experiences and pain responses, maternal attitudes and beliefs regarding pain management strategies for children and peer influences in pain responses. Chapter 3 reviews the complex social context within which adolescents experience pain and a description of and rationale for the study's design. Studies 1, 2 and 3 are presented in detail in Chapters 4, 5 and 6, respectively and a general discussion of the studies' findings and implications is presented in Chapter 7. Finally, Chapter 8 provides an overview of the

contributions of this project to pediatric pain research, the limitations of the studies and outlines future research initiatives.

CHAPTER 2

Pain Among Adolescents

2.1 Pain Prevalence

Pain is a common complaint among adolescents. They report various pain symptoms and apply a variety of pain management strategies. In a comprehensive review of thirty-four epidemiological studies addressing pain prevalence in adolescents, Goodman and McGrath (1991) reported high prevalence of recurrent pain episodes such as headache or migraine, oral/dental pain, stomach/abdominal pain, limb pain, back pain or multiple pain types. Although this study was extensive, the exact prevalence was difficult to determine because of methodological problems (e.g. wide varieties of measures employed and differing definitions of pain types). Nonetheless, pain complaints are pervasive.

Studies conducted at the Pediatric Pain Lab at Dalhousie University (e.g. Campbell & McGrath, 1999; Chambers, Reid, McGrath & Finley, 1997a; Goodman, McGrath & Forward, 1997) have identified a high prevalence of head, stomach, ear/throat, muscle/joint/back and menstrual pain adolescents. For example, to examine OTC analgesic use and self-administration behaviors of adolescents, Chambers et al. (1997a) conducted a group survey of 651 students in the 7^{th}, 8^{th} and 9^{th} grades of a junior high school in Nova Scotia, Canada. The questionnaire employed assessed pain frequency and intensity, medication use and sources of OTC medications and information. Reported pain prevalence among these adolescents was high for head, stomach, ear/throat and muscle/joint/back. The percentage of students experiencing at least one incident of the aforementioned pain types in the previous 3 months was 90.9%, 80.4%, 76.9% and 83.8% respectively. Of the adolescent girls participating (n=307), 58.6% reported

experiencing at least one episode of menstrual pain in the previous three months (Chambers et al., 1997a). More recent longitudinal studies (Rhee, 2000) and international survey studies (Fichtel & Larsson, 2002; Perquin, Hazebroek-Kampschreur, Hunfeld, Bohnene, van Suijlekom-Smit, Passchier & van der Wouden, 2000) have reported similar trends in pain types and frequencies. The data reported from these studies provide a picture of the prevalence of various pain types experienced by adolescents. Although large epidemiological studies have not been able to ascertain exact prevalence rates of pain, the current literature consistently shows that a variety of pain types are experienced within this age group and that the frequency of pain experiences is high.

2.2 Pain Management

2.2.1 Independence Among Adolescents

Junior high school (early adolescence) is the crucial period during which adolescents begin to independently select different methods of pain management (Chambers et al., 1997a). The transition toward independence in managing one's own pain has been correlated with increases in autonomy associated with other daily activities such as maintaining a tidy room, assisting in household chores and completing homework unassisted (Winkelstein, Huss, Butz, Eggleston & Rand, 1998). From a developmental perspective, adolescents who have reached the formal logical stage of cognitive development understand pain within the context of its physical and psychological components and identify it as something that needs to be resolved. Although their understanding of the complexities of the physiology underlying disease, disease treatment and associated pain may be inaccurate, adolescents are approaching a level of understanding similar to that of adults (McGrath & Craig, 1989).

Fichtel & Larsson (2002) reported that medication use among adolescents was related to pain frequency. Of adolescents reporting frequent headache, 23% reported taking analgesics 1 to 3 times a week and 5% reported daily consumption of analgesics. Similarly, 20% of adolescents reporting back pain, 18% reporting abdominal pain, and 8% reporting muscle pain took analgesics as frequently as 1 to 3 times a week. These data provide information about analgesic use among adolescents, however it was unclear whether or not these analgesics were prescription or OTC medications. Other dimensions of medication use among adolescents, such as availability, knowledge, independence and dosing were not addressed.

More recently, Hansen, Holstein, Due and Currie (2003) conducted a study to examine self-reported medicine use among adolescents for four common health problems (headache, stomachache, sleeplessness and nervousness). The data for this study were obtained from the 1997/1998 Health Behavior in School-aged Children (HSBC) World Health Organization cross-national survey. Twenty-eight countries included a representative sample of 11 year-, 13 year- and 15 year olds. Data were collected using a standardized questionnaire that assessed over 100 variables related to health, health behavior, sociodemographic and psychosocial factors. Medicine consumption was measured with the question "During the past month have you taken any medicine for the following: headache; stomachache; difficulties getting to sleep; nervousness." Participants could respond with "no", "yes – once" or "yes – more than once" (Hansen et al., 2003). Results indicated that the highest prevalence rate of drug use was for headache and stomachache, however prevalence of use varied greatly from country to country. The most frequent use of medication for pain was found to be in North America, the United Kingdom, Ireland and Finland. In all countries, adolescent girls reported using medications for

the treatment of headache and stomachache significantly more than adolescent boys. Medication use for the treatment of headache was found to increase with age for both girls and boys, however the increase was greater for girls. For stomachache, medication use increased with age for girls but decreased with age for boys. Types of medications used, autonomy of use, dosing, knowledge and attitudes were not assessed.

2.2.2 Over-the-Counter Medications

For adolescents, pain management choices are often facilitated by the availability of medications. In the home, Chambers et al. (1997a) reported that the most common sources of OTC analgesics were parents (68.5% - 82.3%) and the home medicine cabinet (42.9% - 60.9%). In a design similar to Chambers et al. (1997a), Sloand and Vessey (2001) employed a three-part questionnaire to assess demographic information, autonomy of medicine use and common knowledge of medicines among 86 American school children ranging in age from 10 years to 14 years old. Data indicated that 89% of the adolescents surveyed had access to OTC medications in the home. A recent German (Stoelben, Krappweis, Rössler & Kirch, 2000) study designed to assess adolescents' drug use and knowledge surveyed 56 secondary school students ranging in age from15 years to 17 years old. Among other variables, questionnaires were designed to gather information about the types of medication used, extent of medication use and drug knowledge. With respect to availability, 79% of headache remedies were reportedly obtained by adolescents from either the home medicine cabinet or by self-purchase. In addition, this study found that availability of medications in the home medicine cabinet was positively correlated to drug consumption.

Chambers et al. (1997a) reported a high proportion of adolescents taking OTC analgesics for pain complaints, with greatest frequency of self-medication for head pain (95.9%) and menstrual pain (88.5%). The OTC analgesics used included: acetaminophen, ibuprofen, aspirin, and acetaminophen or aspirin with codeine. These medications were largely available in the home and the pattern of OTC analgesic use for the majority of adolescents (58%) surveyed was self-administration without first checking with an adult.

Self-medicating without adult supervision or guidance has also been reported among adolescents at summer camps in the United States. Rudolph, Alario, Youth and Riggs (1993) reported that among 459 children attending summer camp, over 50% of adolescents brought medications and self-administered those medications. Further, over 77% of the adolescents surveyed reported self-administration of medications at home, based on their own decisions.

2.2.3 Non-pharmacological Strategies

A limited body of research has addressed adolescent girls' pain management strategies for menstrual discomfort. However, the high prevalence of menstrual pain among adolescent girls allows for a convenient sample with which to address pain management strategies. Mild to moderate menstrual discomfort in this age group is reported at 46% to 70% and prevalence is higher during adolescence than adulthood (Andersch & Milsom, 1982; Campbell & McGrath 1997; Klein & Litt, 1981; Shye & Jaffe, 1991). In a recent study addressing adolescents' strategies for treating menstrual discomfort, 289 female students from a Canadian high school were surveyed about their menstrual history, discomfort, symptom severity and pharmacological and non-pharmacological pain management strategies (Campbell & McGrath, 1999). Findings indicated that 70% of the girls were taking OTC analgesics to relieve menstrual discomfort,

however, patterns of self-medication included falling short of the recommended daily dosage of OTC analgesics or, for 21%-30%, not taking OTC analgesics at all to relieve significant pain. Also reported was a small (6%) but important subgroup of adolescents who exceeded the recommended doses. In addition to OTC analgesic use, 98% of the girls surveyed had employed at least one non-pharmacological strategy for pain relief, such as rest, heat, exercise and rubbing/massage. The main reasons for using non-pharmacological strategies to alleviate menstrual discomfort were convenience, preference for not using drugs, ineffectiveness of medication and unavailability of medication. However, all of the non-pharmacological strategies were reported to be less than 50% effective and alternative remedies, such as herbals were not investigated.

2.3 Gender Differences

A substantial body of literature has investigated gender differences in pain experiences among children and adolescents. In an extensive critical summary of the research investigating gender variation in children's pain experiences, Unruh and Campbell (1999) reported that the most frequently reported recurrent pain types in childhood and adolescence are headache or migraine, facial pain, musculoskeletal/back pain, abdominal pain and multiple pain types "in conjunction with other physical symptoms thought to be of psychological origin" (p. 210), or somatization. According to the literature reviewed, by adolescence, girls reported more headache/migraine pain, abdominal pain and somatic complaints than adolescent boys (Unruh & Campbell, 1999).

2.3.1 Biological Mechanisms

The most obvious biological gender difference in pain among adolescents is pain due to menstruation. Primary dysmenorrhea is the most prevalent pain type associated with menstruation and is characterized by moderate to severe pain in the absence of organic pathology (Unruh & Campbell, 1999). More than half of adolescent girls report menstrual pain or discomfort as mild in severity; fewer than 20% report severe pain associated with menstruation (Campbell & McGrath, 1997; Klein & Litt, 1981).

In their review, Unruh and Campbell (1999) report that gender differences in headache and migraine may be attributable to the rise and increased fluctuation of hormone levels in girls during puberty (Silberstein & Merriam, 1993) and that higher rates of abdominal pain reported among adolescent girls, than adolescent boys, were likely due to menstrual pain. Studies that have controlled for menstrual pain have uncovered no gender differences for abdominal pain (Aro, Paronen & Aro, 1987; Aro, Hänninen, & Paronen, 1989). Evidence for gender differences in facial pain, musculoskeletal/back pain, or growing pains have been mixed (Unruh & Campbell, 1999).

During adolescence, the onset of puberty and menstruation puts girls at higher risk for pain and making greater use of different pain management strategies (Campbell & McGrath, 1997, 1999; Chambers et al., 1997a). Chambers et al. (1997a) found that girls are more likely than boys to self-administer medication for head pain and by grade 9, girls are more likely than boys to self-medicate for stomach pain, some of which may be menstrual pain. The obvious sex difference of menstruation however, cannot be ignored. Fluctuations in hormone levels with menstruation could result in sensitization of some women to pain while other women may

develop a greater tolerance for pain, leading to greater variability of pain behaviors in women. Epidemiological studies indicate that women do use pain medication at a higher rate than men do (Eggen, 1993; Furu, Straume & Thelle, 1997). A possible reason for apparent differences in OTC use seen as early as adolescence is that knowledge of analgesics for menstrual discomfort may be generalized to other kinds of stomach pain (Chambers et al., 1997a). Although this has not been investigated among adolescents, there is evidence in the adult literature (Hart & Hill, 1997) that supports the hypotheses suggesting that females experiencing frequent menstrual discomfort may generalize their OTC analgesic use to somatic complaints unrelated to the menstrual phase.

2.3.2 Psychological Mechanisms

Pain catastrophizing (rumination of pain experience and exaggeration of pain appraisal and response) has also been shown to vary with gender in lab studies. Sullivan, Tripp and Santor (2000) employed 80 undergraduates from a Canadian university to undergo a cold-pressor task during which respondents were asked to rate their current pain on an 11-point scale. Following the task, participants were administered the Pain Catastrophizing Scale (PCS) (Sullivan, Bishop & Pivik, 1995), a 13-item measure for which respondents indicate the degree to which they experienced thoughts or feelings related to the pain event. Pain behaviors such as actions involving the immersed arm, actions not involving the immersed arm, grimacing and vocalizations were coded from videotape following the experiment. Findings indicated that female undergraduates reported more pain during the cold-pressor task, displayed more pain behaviors both during and after the task and scored higher on the PCS than male undergraduates (Sullivan et al., 1995).

Prospective research indicates that pain catastrophizing may also be related to self-medication among adolescents. In their survey of coping strategies and self-medication trends for recurrent pain among junior high school adolescents, Bédard, Reid, McGrath and Chambers (1997) reported that high catastrophizers experienced pain in greater frequency and of greater intensity than low catastrophizers and employed coping strategies that did not result in a significant reduction of their pain experience. The inability to effectively cope with pain resulted in OTC medication use - high catastrophizers self-medicated with OTC medications more frequently than low catastrophizers. Gender differences were also apparent in this study. Catastrophizing was seen more frequently in girls than boys. However, girls in this study also reported more pain than boys, likely the result of increased frequency and severity of pain associated with the onset of puberty.

2.3.3 Socialization Mechanisms

Aside from the biological and psychological mechanisms that put adolescents at differing risks for pain and/or pain expression, the socialization of pain responses plays an important role in gender variation of pain experiences. Certainly, how children are socialized to experience and express pain begins at a very early age. How caregivers and parents respond to children's pain episodes may be influential in how children express pain and later interpret and manage pain episodes independently. Research on parents' and caregivers' attitudes and behaviors toward children's pain indicates that parents believe toddler boys are less sensitive to everyday pain (e.g. bumps and cuts) than girls, that comforting a child in pain promotes crying, that boys handle pain better than girls and that girls are comforted more for pain episodes encountered at daycare (Grunau, Whitfield & Petrie, 1994; Fearon et al., 1993; Schecter, Bernstein, Beck, Hart &

Scherzer, 1991). Repeated encounters with pain episodes and the responses given from caregivers provide very young children with the learning experiences from which to extrapolate future pain behaviors (Campbell, 1978). Where gender differences are concerned, caregiver responses to the child's pain expressions will likely provide the child with information about social display rules and the gender appropriate responses to pain events (Unruh & Campbell, 1999).

In their study of school-aged children's emotional responsiveness to hypothetical scenarios, Zeman and Garber (1996) found that the social display rules for anger, sadness and pain expression depend largely on who is present. Children in this study consciously moderated their emotional responses in front of their peers significantly more than in front of their parents and girls were more likely than boys to express pain. The issue then may not be that girls experience more pain or experience pain of greater intensity than boys, but they simply feel more freedom and support in expressing that pain. Further, evidence for parental preference in pain expression was also apparent; by grade five, both boys and girls were less likely to openly express pain to their fathers than to their mothers (Zeman & Garber, 1996).

Social display rules are maintained well beyond childhood. Gender role expectations have been shown to be influential in the expression of pain. Koutantji, Pearce and Oakley (1998) investigated the frequency of pain types and incidents and the relationship to individuals' pain models among undergraduates in the United Kingdom. One hundred and thirty students (mean age = 22.12 years) were administered the Family Health Questionnaire which assessed pain experiences during the previous month of both the participant and the participants' immediate relatives and/or significant others. Results indicated that female participants reported

significantly more pain models than male participants, reported more female models than male participants and reported more pain symptoms than male participants (Koutantji et al., 1998). Moreover, there was a positive correlation between number of pain models and number of reported pain symptoms. That is, the more pain models that a participant reported, the more pain symptoms they themselves had experienced within the previous month. Koutantji et al., (1998) concluded that for females, social learning via observation of many pain models – particularly female models – may provide females with a supportive outlet for pain expression, subsequently providing women with numerous opportunities from which to learn socially acceptable pain responses for females.

More recently, Wise, Price, Myers, Heft and Robinson (2002) demonstrated that gender role expectations of pain response are apparent in the lab setting as well. One hundred and forty-eight undergraduate (mean age = 20.9 years) students from the University of Florida were recruited to undergo thermal testing, via thermal probe delivering heat stimuli below, at and above the individuals' pain threshold. In addition to pain intensity, threshold and tolerance rating, participants were required to complete the Gender Role Expectations of Pain questionnaire (GREP) (Robinson, Riley, Myers, Papas, Wise, Waxenberg & Fillingim, 2001). The GREP is designed to assess participants' views of the typical male's/female's sensitivity to pain, pain endurance and willingness to report pain, as well as the participants' view of how they compare to the typical male/female across the same dimensions (Wise et al., 2002). Results indicated that although there were significant sex (biological) differences between male and female participants (e.g., males had significantly higher pain thresholds and pain tolerance and significantly lower unpleasantness ratings than females), the gender (socialization) differences

found provided further support for the influence of social constructs on pain expression. On the GREP, male participants reported significantly greater pain endurance than the typical woman and female participants reported significantly more willingness to report pain than the typical man. Hierarchical regression analyses, controlling for age, indicated that GREP scores predicted an additional 7%, 11% and 21% of the variance in pain threshold, pain tolerance and pain unpleasantness respectively (Wise et al., 2002). These data demonstrate that although sex differences may be apparent in how individuals experience pain, the gender differences that are learned via social modelling of pain expressions are an equally important component in the understanding of pain expression.

2.4 Knowledge

Knowledge of OTC analgesics and the conditions for which OTC analgesics are appropriate may be lacking in both the adolescent and young adult population, subsequently affecting the actions they take to manage their pain. Myers, Otto, Harris, Diaco and Moreno (1992) studied 196 high-school students to investigate naiveté around the potential hazards of acetaminophen. Although all of the students knew that acetaminophen was used for pain relief, almost 30% also believed that it could be used to treat the cause of colds or flu. Additional lack of knowledge was apparent for harm issues; 23.5% of the students underestimated the dose necessary to cause harm and 17% did not believe that acetaminophen could be lethal. In this group, 93% had access to acetaminophen in their homes.

In their assessment of autonomy in medication use among young adolescents, Sloand and Vessey (2001) reported that 89% of adolescents had access to medicines in the home, 64% of adolescents requested their last medicine from a parent and 34% medicated themselves

independently. Common knowledge of medicines among the adolescents was determined by the appropriateness of medication choice for various complaints. The most appropriate medication choices were made for headache (87.2%), fever (62.7%), sore throat (60.4%), cough (54.6%) and sinus (40.7%). Non-pharmacological treatments were also reported by adolescents such as tea or ginger-ale for stomach-ache and rest for headache. Lack of knowledge regarding appropriate treatment was most common for stomach-ache, vomiting, and diarrhea. Although this study provided a description of self-medication and knowledge of appropriate medication use, it is lacking in information about occurrence and frequency of pain episodes, patterns of medication use and acquisition of knowledge among the participants.

In order to determine adolescents' knowledge of the toxicity of OTC medications, Huott and Storrow (1997) surveyed a convenience sample of 203, 13 – 18 year olds registering at acute care or emergency department facilities in the United States. A questionnaire was administered to assess knowledge of the toxicity, lethality and presence of alcohol in 15 specific OTC medications. Findings indicated that for the OTC medications potentially lethal in over-dose, adolescents were not in full agreement; 63% of respondents believed that aspirin could be lethal, 57% believed that acetaminophen could be lethal, 46% believed that antihistamines could be lethal and 24% believed that iron could be lethal. Of those OTC medications non-lethal in over-dose, 51% of adolescents believed ibuprofen could be lethal and 45% believed that decongestants could be lethal. These data indicate that many adolescents are unaware of the toxicity of some OTC medications. It is worthy to note however, that several of the highly toxic OTC medications that adolescents reported to be safe were preparations not normally found in the home such as camphor (which can cause seizures) and methyl salicylate (which can cause

death in over-dose). Conversely, OTC medications that are considered to be non-lethal in overdose, such as ibuprofen, were considered by adolescents to have lethal capabilities. Perhaps more importantly, were the findings from sub-group analyses indicating that neither age nor grade significantly enhanced adolescents' knowledge about toxicity. Clearly there is confusion among adolescents about the toxic and non-toxic characteristics of common OTC preparations.

Stoelben et al. (2000) administered an extensive questionnaire requiring adolescents to define terms like "drug", "adverse drug reaction", "antibiotic", "analgesic" and "prevention", list all the drugs they knew and report their indications, describe the pathway taken by oral medications to destination, provide statements about alcohol use while taking drugs and comment on the side effects of topical agents. Of a possible high score of 13, mean drug knowledge among participants was 5.74 (SD 1.89). The most common medications listed by the participants were non-opioid analgesics (39%); these were also the most consumed. Consistent with the prevalence literature, girls consumed more headache remedies than boys both acutely (within the previous 2 weeks) and chronically (within the previous 6 months). With respect to knowledge of drug terminology, only 6% of the respondents could define "analgesic" and 26% of the participants could correctly identify the pathway taken by a medication to its treatment site. Sixty-two percent of the respondents reported reading patient package inserts for information about prescription drugs, however this had no influence on adolescents' drug knowledge and was not correlated to adolescents' recall of items on the inserts.

Although this study falls short of providing a clear picture of OTC medication knowledge (e.g., OTC medications and prescription medications were analysed together and the appropriateness of medication choice was not assessed), almost 75% of participants rated their

knowledge of medications as good or satisfactory. Advanced understanding of largely clinical or pharmacological terms is likely irrelevant in the safe use of OTC preparations. Nonetheless, the findings lend further support to the existing prevalence literature. More interestingly, however, was the finding that 38% of the adolescents reported nervousness and aggressiveness as physical symptoms experienced within the previous 12 months. This finding suggests that adolescents may self-medicate for stress symptoms; psychosocial stress significantly influenced drug consumption with those adolescents reporting stress consuming more drugs than those not reporting stress. Adolescents may be using OTC medications for off-label use.

Scholder-Ellen, Fitzgerald-Bone and Stuart (1998) surveyed 294 American college undergraduates about their use of acetaminophen and ibuprofen. Participants were asked to indicate the frequency of use over the previous 30 days, length of time between doses, amount of medication taken per dose and comment on the correct recommended dosage. In addition, participants were required to list the on-label purposes (appropriate use as defined by the Federal Drug Administration label) of the medications, provide a list of off-label uses (uses that are not approved by the Federal Drug Administration labelling) that they may be aware of and indicate the frequency of their personal off-label use. Results indicated that 35% of the respondents had used acetaminophen within the previous 30 days. Of those users, 36% knowingly used more than the recommended dosage and 10% had used the analgesic for off-label purposes such as to stay awake, prevent a hangover or get a "buzz." Findings were slightly different for ibuprofen. Of the 39.9% of respondents who had used ibuprofen over the previous 30 days, 86% of those users reported using more than the recommended dosage. For those exceeding the recommended dosage, 50.9% reported that over-use was unintentional (i.e., they over-stated the correct label

dosage, but took the overstated amount), whereas 33.3% intentionally took more than the recommended dosage (overstated the label dosage and then took more than the over-stated amount). Fifteen percent of the respondents indicating using ibuprofen for the same recreational purposes noted for acetaminophen.

Although the definitions of off-label drug use in this study are somewhat questionable (e.g., to prevent headache associated with hangover) and the implications of off-label drug use overly negative (i.e., off-label drug-use need not be bad when supervised by a physician), this study contributes to our understanding of medication use among adolescents. Where most of the studies addressing adolescents' OTC medication use have remained largely descriptive, Scholder-Ellen et al. (1998) provide a theoretical framework within which to understand OTC medication over-use in college-age young people, namely the Theory of Problem Behavior (Jessor & Jessor, 1977). The Theory of Problem Behavior suggests, in short, that a young person's social surroundings, in particular their sense of parental/peer support (perceived approval of behavior via overt discussion or observations of parent/peer behaviors) and parental/peer approval (perceptions of the extent to which parents/peers listen to or show interest in the adolescents' emotions and behaviors), have an important effect on behavior. If a young person perceives parental/peer approval for problem behaviors, such as drug use, then that behavior is more likely to occur (Jessor & Jessor, 1977). Scholder-Ellen et al. (1998) found that the primary predictor for both intentional/non-recreational over-use and recreational users was perceived peer support. Although the purpose of this study was to assess predictive factors (e.g., parental approval, peer approval, parental support, academic achievement, self-esteem and misinformation) of young people's OTC medication abuse, as opposed to use, it is the only

known study in the existing literature to examine the important social influences on adolescents' pain management choices and behaviors.

2.5 Development of Attitudes and Knowledge

2.5.1 Media Influences

Adolescents are heavily exposed to messages from various media sources that impress upon them the danger of illicit drugs (McGrath, 1996). For example, anti-drug campaigns in the United States have been successful in heightening adolescents' awareness of the dangers of drug use. Increased recall of anti-drug advertisements have been associated with the decreased probability of marijuana and crack or cocaine use among adolescents (Block, Morwitz, Putsis & Sen, 2002). Although no research has been done, one would expect that the negative picture presented of illicit drugs might translate into negative attitudes about licit medication. However, junior high school students do not rate the media as a particularly influential source of information about OTC medication. Parents and packaging appear to be the two most significant sources of information (Chambers et al., 1997a). This is not to say that adolescents are unaware of OTC medication advertisements in the popular media. In a study assessing the prevalence of health conditions among young college students and their use of medications frequently advertised in popular magazines, Burak and Damico (2000) reported that the most commonly mentioned conditions (headache, menstrual discomfort, allergy, acne, muscle ache/pain) were treated most frequently with 3 of 14 regularly advertised medications – Advil®, Midol® and Excedrin®. Moreover, 84% of respondents reported that they look at advertisements for medication and, on average, could recall seeing advertisements for 6.2 of the 24 listed medications. The three most commonly used OTC analgesics were in the top four medications

whose advertisements were reported as most often noted by participants (Burak & Domico, 2000). Similarly, where non-pharmacological strategies are employed, adolescent girls report parents and friends to be the primary sources of information, however the media (e.g., books, magazines, advertisements) was a commonly cited source of information as well (Campbell & McGrath, 1999).

2.5.2 Role of Parents

Individuals are social perceivers, and accordingly, attitudes are formed in a social context. Not only are the contents of our minds developed through social interactions, but our day to day functioning, at a cognitive level, is entrenched in the interaction between social context and processes (Turner & Oakes, 1997). The primary source of attitude development is social learning, where interactions with others or mere observation shape our social perceptions and behavior (Pratkanis, Breckler & Greenwald, 1989). For very young children, parental values shape health-related behavior by providing guidelines regarding appropriate behavior across various situations (Campbell, 1978).

The intergenerational transmission of information about pain begins very early in the developing child's life. Parents function in the role of protector, ensuring that children become aware of potential dangers via careful monitoring, guidance and safety promotion (Craig, 2002). This guidance prepares children to take on the responsibility of their own safety as they approach independence from their parents. Within the family dynamic, children are also exposed to numerous episodes resulting in either their own pain experience or that of others. With each observed episode of a parent's pain experience, children learn how to respond to and cope, with or without success, physical threats resulting in pain (Craig, 2002).

Pain can co-occur between parents and children. This aggregation of pain complaints within the family may be influenced by genetics as well as physical proximity and shared environment (Goodman et al., 1997; Walker, Garber & Greene, 1991). Walker et al. (1991) studied the relationship between somatization symptoms in children with recurrent abdominal pain and their parents in order to assess the extent to which pain complaints are manifested within the family. Findings indicated that higher levels of somatization in both mothers and fathers were associated with higher levels of somatization in children with recurrent abdominal pain. Walker et al. (1991) proposed that parental modeling and reinforcement of illness behaviors in children by their parents likely influence both the development and maintenance of frequent somatic complaints in children who are otherwise healthy.

Such aggregation of pain complaints is also apparent in non-clinical samples. Goodman et al. (1997) examined the degree of concordance in number and severity of pain incidents between parents and children in a non-clinical community sample in Nova Scotia, Canada. Six hundred and ninety-three families completed a seven-day pain diary in which they were asked to log the location, cause, duration and intensity of each pain incident for each day. Participants were also required to complete a Pain Disability Inventory (Walker et al., 1991) to determine the impact of each pain incident on daily functioning. Findings supported the hypothesis of aggregation of pain within the family. Increased numbers of painful, clinically severe and disabling pain incidents reported by parents over the 7-day study period was associated with increased reporting by children of the same pain incidents (Goodman et al., 1997). Parents provide children with opportunities to learn how to behave when in pain, and when parental

incidents increase in number, so do the opportunities from which children can model their future pain experience (Campbell, 1978; Goodman et al., 1997).

Modeling of parental pain behaviors has also been demonstrated in the lab setting where mothers emerge as powerful models for adolescents' acquisition of pain responses. For example, Goodman and McGrath (2003) demonstrated that training mothers to respond in either a pain-exaggerated or pain-minimizing fashion to experimental pain had a significant impact on how the children who had observed them later responded to similar experimental pain. Chambers, Craig and Bennett (2002) assessed another mechanism through which parents transmit information to their children about pain and pain behaviors. In a lab-based study at a Canadian university, one hundred and twenty 8 year- to 12 year old children immersed their arm in cold water while their mothers engaged in either pain-promoting talk (reassurance, empathy, apology, mild criticism), pain-reducing talk (nonprocedural talk, humour, direction to engage in coping strategies), or neutral talk (usual interactions). There was a strong influence of maternal response on girls' subjective reports of pain. Daughters of mothers who engaged in pain-promoting talk reported more pain than those daughters whose mothers engaged in neutral talk. These daughters in turn reported more pain than those daughters whose mothers engaged in pain-reducing talk (Chambers et al., 2002). The effect was not apparent for boys, which raises questions about gender differences and the socialization of boys versus girls in terms of pain responses.

Studies of aggregation of pain complaints in families and lab-based studies of parental response provide evidence for the modeling of pain behaviors. Parents who self-report high frequency of pain episodes or encourage pain behaviors for their children's pain episodes are also providing their children with a high number of opportunities to learn about pain and pain

behaviors. It is not unreasonable to assume that pain management strategies may be acquired via the same mechanism. Although no known research has addressed the role of parental modeling in the acquisition of attitudes and behaviors surrounding pain management choices, there is some evidence pointing in that direction. For example, we do know that adolescent girls report learning physical (e.g., rest, heat, exercise, rubbing/ massage) and psychological (e.g. imagining pain to be not as bad as it is, praying/hoping pain will go away) strategies for menstrual pain relief through their parents (Campbell & McGrath, 1999).

2.5.3 Maternal Attitudes and Beliefs About OTC Analgesics

Given the availability of OTC medications in the home, it is likely that children have observed their parents, on many occasions, self-administering medications for their own pain or dispensing medications for their children's pain. Repeated exposures to these incidents become learning opportunities for children to acquire information about their parents' attitudes and practices toward OTC medications.

Little research has assessed parents' attitudes toward medications for children. Where opioid use is concerned, attitudes have been found to be quite negative among the public, patients and healthcare professionals (Forward, Brown & McGrath, 1996). Studies assessing parents' management of their children's post-operative pain show that parents consistently under medicate children experiencing significant pain and interpret children's requests for more medication as a sign of addiction (Finley, McGrath, Forward, McNeill & Fitzgerald, 1996; Knight, 1994; Gedaly-Duff & Ziebarth, 1994). In their assessment of children's post-operative pain management by parents, Finley et al. (1996) reported that even though 81% of parents surveyed agreed that acetaminophen is safe and 89% agreed that it is safe to give children the

recommended dosage of acetaminophen, clear hesitancy of use was apparent; 60% of children in significant pain were administered by their parents zero to three doses of acetaminophen per day where they could safely receive up to six doses.

It is unclear why parents are reluctant to administer pain medications to their children. Lack of knowledge may be a factor. Finley et al. (1996) reported that over 80% of the parents surveyed in their post-operative pain management study were either given inadequate information or could not remember what they had been instructed to do for their child's pain when released from day surgery. Similarly, lack of knowledge about pain medications themselves can result in unfounded concerns about tolerance, addiction and dosing, and subsequently, negative attitudes about pain medications.

Negative attitudes and lack of knowledge among parents managing children's post-operative pain was the basis of a randomized trial of a pain education pamphlet by Chambers, Reid, McGrath, Finley and Ellerton (1997b). Eighty-two parents of children, between the ages of 2- and 12-years, undergoing day surgeries were randomly assigned to one of three groups. Prior to admission, participants were given one of three booklets. The 'pain education group' were given a 15-page guide about assessing and managing children's pain. The 'pain assessment group' were given a similar booklet, however the content dealt only with pain assessment and general information about pediatric hospital visits. The 'no pain education' group were given a booklet that dealt only with the pediatric hospital visit. Following surgery, parents were sent home with pain assessment scales on which they were to rate their child's worst pain, on a five-point scale, at five periods throughout the postoperative days. Parents were also required to keep a detailed log of medication administered. Finally, parents' attitudes toward children's pain

medications were measured using an attitude scale. Comparisons between groups indicated that parents in the pain education group expressed more positive attitudes about acetaminophen use in children than parents in either of the other groups. More positive attitudes were associated with higher number of doses administered on all three post-operative days. Despite positive attitudes, there were no significant differences between groups in the amount of pain medication administered to children on the first two post-operative days. Although parents in the pain education group administered more medication to their children than parents in the other two groups, it was not until post-operative day three that this difference was statistically significant. Lack of improvement in medicating behavior among parents in the pain education group was attributed to small sample size and the nature of the pain education booklet, which was not specific to day surgery pain assessment and pain management but rather many types of pain (e.g., cancer, acute pain) and pain management strategies (e.g., massage, distraction). Nonetheless, the data provide evidence that parents' attitudes toward pain medication are influential in how they decide to manage their children's pain.

A similar study was recently completed by Huth, Broome, Mussatto and Morgan (2003). Using the Pain Assessment and Management for Parents (PAMP) (Maxishare, 2000) as an intervention, an educational pamphlet designed to teach caretakers about various aspects of child pain, Huth et al. (2003) compared an education group to a standard care group across several variables including knowledge about and attitudes toward pain medication as well as analgesic use. Participants were 51 children (mean age = 9.97 years), scheduled to undergo cardiac surgery in a Midwest teaching hospital, and their parents. Participants randomly assigned to the education group were given the PAMP pamphlet to review prior to their children's surgery.

Results from this study indicated that attitudes toward pain medication among those parents in the education group significantly increased following PAMP training (the first post-operative day). This was not the case for those parents who received no special pain assessment/management instruction, however there were no differences in attitude scores between either group on the first post-operative day (Huth et al., 2003). With respect to medication use, nonopioid analgesic administration increased significantly over the three days following surgery for both groups. Although parents who received PAMP training administered more analgesics to their children on the first post-operative day than control group parents, this difference was not significant (Huth et al., 2003). These findings are similar to those reported by Chambers et al. (1997b), however in this study there were no direct correlations drawn between parents' attitude scores and subsequent analgesic administration. Nonetheless, these data provide further support that increasing knowledge about pain management and pain medication can increase positive attitudes toward the same.

Much remains unknown about mothers' attitudes toward pain medication for children in the non-clinical setting. Forward et al. (1996) employed 298 mothers of children 5-12 years old to participate in a telephone survey designed to assess mother's attitudes toward acetaminophen and determine how those attitudes influenced their behavior where medicating their children was concerned. A comprehensive attitude scale was developed for the study and included five conceptually based subscales, with four items each, on addiction, tolerance, side effects, stoicism and drug abuse. Responses for each item were made on a 7-point Likert scale. For example, mothers were given the statement "Children should be given Tylenol®", to which they would reply with either "strongly agree", "agree", "slightly agree", "uncertain", slightly disagree",

"disagree" or "strongly disagree". In addition to the attitude scale, Forward et al. (1996) incorporated measures to determine whether or not attitudes influenced medicating behaviors. Mothers were also asked which children's pain medications they kept in the home, how often they had used those medications in the previous month and whether or not they would treat a hypothetical 5-12 year old with medication for 5 common childhood pain complaints.

Results indicated that mothers kept an average of 4.04 children's pain medications in the home, 96% of mothers kept acetaminophen in the home and 75% of mothers reported giving children acetaminophen within the previous month. There was a positive correlation between the number of children's medications kept in the home and the frequency with which children had been administered medications in the previous month. Where mothers were queried about treating children's hypothetical pain, 89.6% of mothers reported they would treat headache, 84.9% reported they would treat earache and 39%-55% reported they would treat muscle, injury or stomach pain with medication.

The attitude measure indicated that mothers' attitudes concerning tolerance and side effects associated with acetaminophen use were quite negative. Negative attitudes concerning tolerance were associated with fewer doses of acetaminophen having been administered in the previous month and higher level of pain severity at which point acetaminophen would be administered for pain relief. Negative attitudes concerning side effects were associated with fewer medications being kept in the home. Lack of knowledge among mothers was apparent as well. More than 35% of the mothers interviewed agreed that acetaminophen worked best if saved for when pain was quite bad. However, acetaminophen is widely used with young children with

minimal side effects and there is no empirical evidence that supports the development of tolerance or addiction to acetaminophen (Forward et al., 1996; Maunuksela, 1993).

Little research has directly addressed adolescents' attitudes toward OTC analgesics, however Warner, Schnepf, Barrett, Dian and Swigonski (2002) recently assessed nonsteroidal anti-inflammatory drug (NSAIDs) use among male adolescent football players in order to describe users versus non-users and further understand the attitudes and decision-making strategies of NSAID users. Participants were 604 male high school football players (mean age = 15.8 years) who were administered a questionnaire designed to assess NSAID use, decision-making, attitudes and dosing. Results indicated that 75% of adolescents had used NSAIDs within the previous three months and 15% of the participants were daily users of NSAIDs. Compared to infrequent users, daily users were more likely than infrequent users to use NSAIDs prophylactically, perceived performance enhancement with NSAID use (a positive attitude) and decided independently, without consulting a coach or parent, to administer NSAIDs. Although the harmful effects of NSAIDs when used under extreme dehydration conditions was of concern in this study, there was no assessment of adolescents' knowledge of harm issues. Even though there are several methodological flaws with this study (e.g., there were no measures of pain intensity or frequency, no attitude measure employed and no information on dosing) it is the only known research that has made an attempt to link adolescents' attitudes toward analgesics with analgesics use.

2.5.4 Role of Peers

Peers may play an important role in how adolescents learn to respond to and manage their pain. Although no known research has addressed the influential factors of peers in pain

management choices, studies have addressed their influential role in making health-related choices. A wide body of literature addresses peer influences on health-related behaviors such tobacco use, alcohol use, marijuana use and sexual activity (Murray, Kiryluk & Swan, 1985; Neumark-Sztainer, Story & French, 1997; Wolin & Wolin, 1995). In their research investigating reasons for smoking in children, Swan, Cresser & Murray (1990) reported that young adolescents were more likely to pick up the smoking habit if their siblings and peers also smoked.

Recently, Beal, Ausiello and Perrin (2001) set out to determine the extent to which peer-influences out-weigh parental influences in the acquisition of health-risk behaviors. Two hundred and eight 7th grade students completed a questionnaire assessing cigarette use, alcohol use, onset of sexual activity and marijuana use. In addition, measures were obtained for parent and peer approval or disapproval and modeling for each of the activities. Results indicated that adolescents reported peers were the most influential source for health-risk behaviors; peer disapproval was the only factor associated with both marijuana and tobacco abstinence, age and peer modeling were associated with alcohol use and gender and peer disapproval were associated with sexual abstinence. Clearly, how an adolescent perceives their peers to be judging their behaviors can impact adolescents' health behavior choices. However, this study was limited by reliance on self-report measures; there is no way of determining whether reported behaviors were accurate. Nonetheless, these data underscore the importance of peer perceptions in health related matters.

Guite, Walker, Smith and Garber (2001) studied factors that influenced children's liking of a peer with pain complaints by showing 363 4th and 5th grade students vignettes of characters

that had physical complaints in either the presence or absence of organic disease. Following the vignette, participants were required to assess how much they liked the character, how severe they perceived the character's symptoms to be and the extent to which the character should be relieved of responsibilities such as going to school. Findings indicated that at a very young age, children understood the difference between symptoms with and without organic disease, and perceived those with organic cause as more severe. Both boys and girls rated male characters' pain as more severe in the presence of organic disease suggesting that gender differences in the socialization of pain responses may begin quite early. Other findings were highly suggestive of different social role expectations for boys and girls; boys were more likely to grant relief from responsibilities to female characters with organic disease than female characters without; regardless of organic disease, boys were not likely to relieve male characters of responsibility; girls granted female characters relief from responsibility where there was no organic disease, but were not likely to do the same for male characters. The gender differences reported in this study provide some insight into how young children are socialized to perceive their peers pain experiences, how they expect their peers to behave in pain situations and how those perceptions and expectations are influenced by gender. Awareness of these social role expectations at such an early age is likely to influence the expression of pain and perhaps, the pain management choices opted for.

2.6 Summary

The literature reviewed in the previous sections provides information about pain and pain management among adolescents. We know that (a) adolescents experience a wide variety of recurrent pain types, (b) adolescents independently self-medicate for their pain using OTC

analgesics (c) gender differences are apparent among adolescents for both pain frequency and OTC analgesic use, and (d) knowledge about the proper uses of OTC analgesics, as well as harm issues, is often poor.

What remains unknown about the adolescents' pain experience is how they acquire information and develop attitudes about pain and pain management, and how these attitudes further affect the pain management choices opted for. Within the social context of the adolescents' world, parents and peers are the primary social influences. We know that peers can influence the acquisition of, or abstinence from, a range of health-related behaviors. However peer influences in the expression of pain and the development of attitudes toward pain and pain management have been ignored in the literature. A few studies have addressed parental attitudes toward analgesics (opioid and non-opioid) in the treatment of their children's pain. These studies have indicated that mothers' attitudes toward pain medications can have a profound effect on how they manage their children's pain. However, to date, no known research has addressed how parental attitudes and behaviors toward the management of their children's pain influences how adolescents later perceive of pain and pain management. What is ultimately lacking in the current pain literature is a fuller understanding of the social context of the adolescent recurrent pain experience. In particular, we are lacking information about social processes through which young people learn about pain and pain management, enabling them to approach adolescence with the information required to make independent choices about their own pain management.

CHAPTER 3

Investigating Pain in Adolescence

3.1 Social Context of Adolescent Pain.

In his socio-communications model of pain, Craig (2002) outlines the underlying social factors that influence the child's pain experience, pain expression and the subsequent assessment and action taken by the child's caregiver (see Figure 1). First, the pain experience will depend on the cognitive capacity of the child. A very young child may not understand the causal connection between an event and resulting pain, whereas an older child approaching adolescence possesses a more sophisticated understanding of causality, as well as the physiological and psychological aspects of pain. The experience of pain will also be influenced by the social context of the pain event. Secondly, pain expression – be it verbal or non-verbal – will be influenced by social expectations and rules of display. Thirdly, the caregiver's response to the child's pain behavior will depend on that individual's knowledge of the child, the child's behavior and attitudes or beliefs about the pain experience. Finally, these factors will ultimately influence the action taken by the caregiver to alleviate the child's pain. This model takes into account the complex social factors that interact to define the pain experience, from tissue trauma to pain management, for the child.

Although this model is presented in the context of the clinical pediatric pain experience (e.g. in-patient post-operative care by healthcare workers or out-patient post-operative care by parents or caregivers), it can be expanded to describe recurrent pain experiences for children or adolescents.

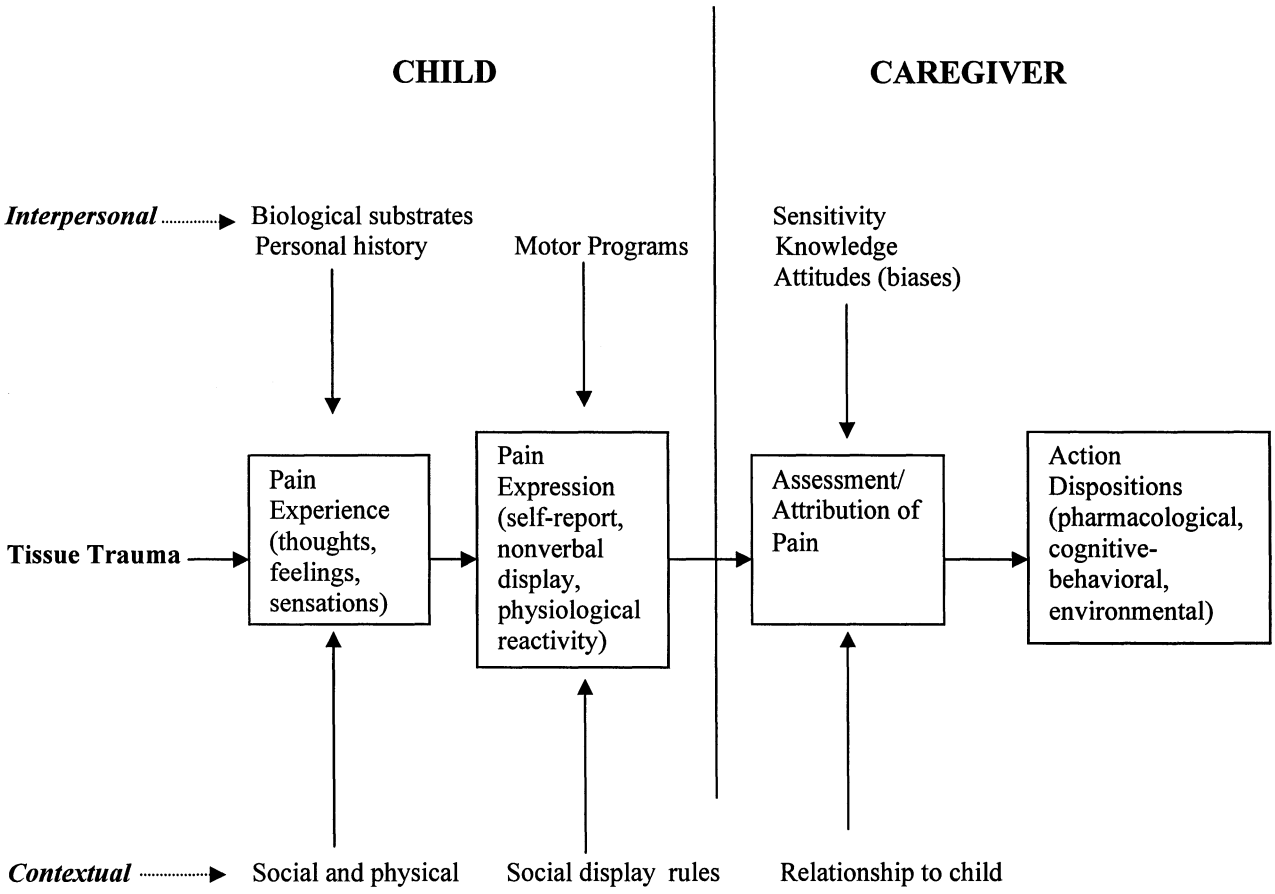

Figure 1. A socio-communications model of the child in pain (Craig, 2002).

3.2 Research Design Rationale

The studies included in the present project were both qualitative (Studies 1 and 2) and quantitative (Study 3) in design. Qualitative methods were chosen for the first two studies for two main reasons. Firstly, there are no known studies that have specifically attempted to describe the attitudes of adolescents as they relate to pain and pain management. Evidence for self-medicating practices among this group falls short of providing information about how adolescents learn about pain management. For this reason, the research was exploratory in nature. In order to design a study that could assess the attitudes and behaviors of adolescents, as well as assess how these attitudes and behaviors are acquired within a social context, it was essential to determine exactly what issues adolescents who independently manage their pain are faced with. Secondly, the end purpose of this research project was to assess commonalities in pain experiences, attitudes and knowledge between adolescents and parents in a way that could be generalized to a population and explained within the theoretical framework of social psychology. Since no theoretical framework exists that specifically addresses the psychosocial aspects of adolescents' recurrent pain, research questions could not be formulated *a priori* without knowledge of the various psychosocial factors. Again, the qualitative methodology allowed for an exploration of issues, with each study informing the next, allowing for the development of both the quantitative measurement tools employed in Study 3, as well as a theoretical explanation of the complex factors that emerged as part of the adolescents' pain experiences. The following section provides an overview of the qualitative methodology.

3.2.1 Qualitative Methodology

Qualitative research methodology is being employed in the social sciences with more frequency. Flick (1998) attributes this to rapid social change creating diversification of "life worlds", subsequently yielding new social contexts and perspectives. Therefore, the principles guiding qualitative research are quite different from those guiding quantitative research. First, the object under study is the determining factor for choosing a research methodology (Flick, 1998). In qualitative research, the object under study is not reduced to a single variable thus allowing a full understanding of complexities within an everyday context. The research is carried out in a natural setting in order to capture social diversity and reality. Subsequently, the goal of qualitative research is not to test assumptions developed *a priori* based on what is already known, but rather to understand social phenomenon in a current context and develop grounded theories (Flick, 1998). The process then is inductive, not deductive. In the present project, studies one and two were concerned with uncovering the attitudes, beliefs and practices surrounding OTC medications among adolescents and parents. Since the social aspects of these variables were of primary interest, the qualitative method allowed for an investigation of these factors within a social context where spontaneous and guided discourse could shed light on important factors.

Second, qualitative research focuses on individual perspectives and the social meaning of those perspectives in way that cannot always be achieved with quantitative research. Qualitative research aims to delve further into questions that can be answered only from a subjective perspective (Flick, 1998). Attitudes and beliefs, as well as health-related behaviors are highly personal and influenced by many social contexts and individual differences. In the present

project, no existing literature provided data from which hypotheses about how adolescents' attitudes and beliefs about OTC medications and their self-medicating behaviors develop. Although the existing literature suggests that parents and peers are influential in the acquisition of attitudes and behaviors, how these individuals are influential remains unclear. In the first two studies, the qualitative methodology allowed for the investigation of these questions while taking into consideration the individual differences in personal history, point of view and social reality.

Finally, where quantitative methodology relies on the elimination of the researcher as a potential source of influence to maintain objectivity, the researcher is inextricably involved in qualitative process (Flick, 1998). The qualitative researcher is an intervening variable in both data collection and analysis bringing subjectivity to every part of the research process. However, the researcher takes into account his or her role in both the data collection and interpretation by maintaining field notes either during or immediately after field visits or meetings. These notes ensure that the data is interpreted in light of researcher influences.

A major criticism of the qualitative methodology is the handling of reliability and validity. The approach of triangulation was originally developed as a validation tool, however it has shifted towards an approach for conducting sound qualitative research and increasing the "scope, depth and consistency in the methodological proceedings" (Flick, 1998; p. 230). Triangulation combines different methods, study groups, settings (local and temporal) and theoretical perspectives throughout the course of studying a particular phenomenon. The data, researcher, theory and method are all taken into consideration when incorporating triangulation into the research process. There are four types of triangulation: (1) data triangulation as a sort of theoretical sampling where data are obtained from many different individuals at different times

and in different settings, (2) investigator triangulation requires employing different investigators to minimize biases and assess researcher influences on the data collection, (3) theory triangulation requires approaching the data with multiple perspectives and hypotheses in mind so that interpretation is not limited to preconceived notion, and (4) methodological triangulation involves the combination of tools either within-method (e.g., subscales for measuring questionnaire items) or between-method (e.g., pairing an interview with a questionnaire).

All four types of triangulation were considered in the design, data collection and analyses of the three studies presented. Data were obtained from different individuals in different settings and geographical locales, different researchers collected or assisted with the data collection and data interpretation, particularly for the qualitative studies, was not limited by hypotheses developed *a priori*. Most importantly was how the methodological triangulation was carried out. The present project employed two very distinct methodologies and a variety of research tools. Focus group sessions in study 1 informed the direction in which study 2 interviews were to take, and both studies 1 and 2 informed the direction in which study 3 was to take. By employing both qualitative and quantitative methodologies and a variety of measurement tools, access to information was not restricted.

3.3 Project Objectives

Despite the evidence for parental and peer influence on health-related behaviors, little is known about adolescents' attitudes toward pain and pain management strategies such as OTC analgesics, non-pharmacological strategies and alternative herbal remedies. More importantly, we do not know how these attitudes develop, and the role of parents and peers in the development of these pain attitudes and practices. To date, there is no known research that

specifically addresses these questions. Of particular interest are 12-14 year olds because this is when adolescents begin to self-medicate (Chambers et al., 1997a; Rudolph et al., 1993). Adolescents at this age find themselves in a cognitive and social developmental stage where self-identity, autonomy and personal values and beliefs begin to emerge (Craig, 2002; Erikson, 1968; McGrath & Craig, 1989). Social influences are an important source of attitude development and the subsequent translation of attitudes into behavior. Given the presence and influence of parents in the adolescents' life, as well as the emerging dependence on peers as autonomy from parents increases, it is hypothesized that parental and peer influences are likely the strongest variables in adolescents' acquisition of pain behaviors and pain management strategies.

The proposed studies seek to describe (1) the use of pain management strategies among young adolescents, their attitudes and knowledge about OTC analgesics, non-pharmacological strategies and alternative herbal remedies, (2) gender differences in practices, attitudes and knowledge (3) and the role of peers and parents in the development of practices, knowledge and attitudes. Finally, and most importantly, the primary objective is to understand the full pain experience within the rich social context of the adolescents' life by developing a psychosocial model of recurrent pain and pain management.

CHAPTER 4

Study 1: Adolescents' Attitudes Toward Pain and Pain Management; The Role of Peers

4.1 Introduction

The purpose of this study was to describe the range of attitudes, beliefs, norms and practices with respect to pain and pain management among adolescents and their immediate peer groups. Of particular interest were the social influences contributing to the acquisition of these attitudes, beliefs, practices and norms.

4.2 Background

4.2.1 Social Context of Adolescent Pain Management

Understanding the adolescent recurrent pain experience in the context of Craig's (2002) socio-communications model requires reformulating whom the caregiver is. By adolescence, young adults become increasingly more responsible for their own pain management and begin the transition away from "parent caregiver" to becoming their own 'caregiver', making decisions based on multiple pain experiences and pain management outcomes. The very nature of the socio-communications model is that pain is experienced in a social context with various influences contributing to the expression, attribution and treatment of pain (Craig, 2002). For the adolescent, immediate peer groups may assume an important role in the acquisition if attitudes and behaviors. No known research has specifically addressed how peers influence adolescents' pain, pain behaviors and pain management choices.

4.2.2 Peer Influences

The socialization of several health-related attitudes and behaviors has been shown to be influenced by adolescents' immediate peer group. This is evidenced by the literature

underscoring the importance of peer perceptions in the acquisition of or abstinence from tobacco, marijuana and alcohol use as well as sexual activity (Beal et al., 2001; Murray et al. 1985; Neumark-Sztainer et al., 1997; Swan et al., 1990; Wolin & Wolin, 1995). Although little is known about how adolescents perceive their peers' pain-related attitudes and behaviors, or how these perceptions might influence adolescents' own pain-related attitudes and behaviors, we do know that the socialization of children's perceptions and expectations of peer pain begins quite early (Guite et al., 2000).

4.3 Study Objectives

The purposes of the present study were to (a) describe the full range of pain types experienced by adolescents, (b) assess the attitudes, beliefs, norms and practices of adolescents with respect to pain and pain management, (c) describe the social influences, specifically peer influences, that affect pain expression and pain management, and (d) and explore gender differences across all variables.

It was hypothesized that adolescent girls would experience more pain types and medicate more frequently for pain than adolescent boys. It was also expected that most adolescents would self-medicate for their recurrent pain without first checking with an adult and that knowledge about OTC analgesics would be generally poor. Finally, it was hypothesized that peers would have a profound impact on how adolescents expressed their pain. Due to gender differences in the socialization of pain responses, gender differences in how adolescents expressed their pain in front of peers were also expected to be found.

4.4 Method

4.4.1 Design

One of the main benefits of focus groups is that they provide insight into everyday social interaction by creating a natural environment wherein participants are influencing and being influenced by others. The focus group procedure was chosen as it facilitates the investigation of (a) a range of attitudes individuals may have on a topic, (b) factors that influence opinions and behaviors, particularly when opinions and behaviors are conditional and (c) research questions from which quantitative research designs may be developed (Krueger & Casey, 2000). This design is also particularly useful when orienting oneself to a new field and generating hypotheses based on participants' insights (Flick, 1998).

Special consideration must be given to adolescents engaging in focus group discussions. A power imbalance is apparent since young people are rarely in structured settings that adults do not control. Therefore, young participants may be wary that their opinion actually counts and may feel threatened that their opinions may be undermined in front of their peers (Krueger & Casey, 2000). To ensure that the participants did not feel that their independence or freedom was being compromised in the focus group setting, special care was taken to maintain a relaxed atmosphere. The moderator is key in ensuring the comfort level of the young person in the focus group situation and in engaging the young person in conversation in a way that will elicit as much information as possible. For this reason an undergraduate research assistant co-moderated the sessions with the research coordinator. The research assistant was young, had experience working with youth groups and was closer in age to the participants than the research coordinator. Before sessions began, adolescents were told that throughout the course of the

discussion they should be aware that (a) there were no right or wrong answers, (b) what was discussed in the group stayed in group (with the exception of suspected self-harm), (c) pain complaints were common and acceptable, and (d) making health decisions was a learning process at any age. These statements were reinforced throughout the sessions so that adolescents would not feel embarrassed by their attitudes or behaviors.

Other considerations specific to the age group employed involved time, atmosphere and location. Focus group sessions were kept to one hour in duration as opposed to the typical two-hour sessions. Adolescents typically live in a world where their schedules change every forty-five to sixty minutes (Krueger & Casey, 2000). Sessions longer than one hour would likely result in boredom. To further ensure a relaxed and casual atmosphere, three focus groups took place at a local mall. The location was chosen because of proximity to the school from where the participants were enrolled, as well as to minimize any sense of subordination for the participants. On the request of the principal of the second school from where participants were recruited, the final two sessions were held on school grounds during lunch break. For all sessions, pizza, donuts and soft drinks were made available to the participants. Running the focus groups as a "pizza party" contributed greatly to a non-threatening atmosphere in which the participants could engage in discussion with their peers.

The questioning route followed for the focus group session followed the guidelines outlined by Krueger and Casey (2000) and outlined in Appendix 1. Conversational flow was elicited initially with easy questions and flowed gradually toward broad, general questions and then toward more specific questions. Several prompts and probes were also incorporated to encourage more talk among the adolescents. Finally, the general rule of thumb in determining

how many focus groups to run is a function of theoretical data saturation. This is the point at which no new information is forthcoming and the full range of ideas and opinions have been expressed (Krueger & Casey, 2000). This typically occurs at the fourth or fifth group. In the present study five focus groups were planned and run to the point of theoretical data saturation.

4.4.2 Participants

Participants were 7th-, 8th- and 9th grade students from a junior high school in Halifax, Nova Scotia. Approval for the conduct of this study was initially obtained from the university ethics review board (see Appendix 2), school principals and teachers. Three weeks before the study began, consent forms describing the study (see Appendix 3) were distributed for students to give their parents. Parental consent and child assent were required in order to participate. Participants were compensated for their time with movie video vouchers.

The flow of prospective participants throughout the recruitment process is presented in the Figure 2 below. The final sample consisted of 11 male students (M = 13.45 years, SD = .93, range = 12-15 years) and 13 female students (M = 13.31 years, SD = .85, range = 12-15 years), randomly assigned to 1 of 5 same-gender focus groups (3 male, 2 female; range of participants per group=3-9).

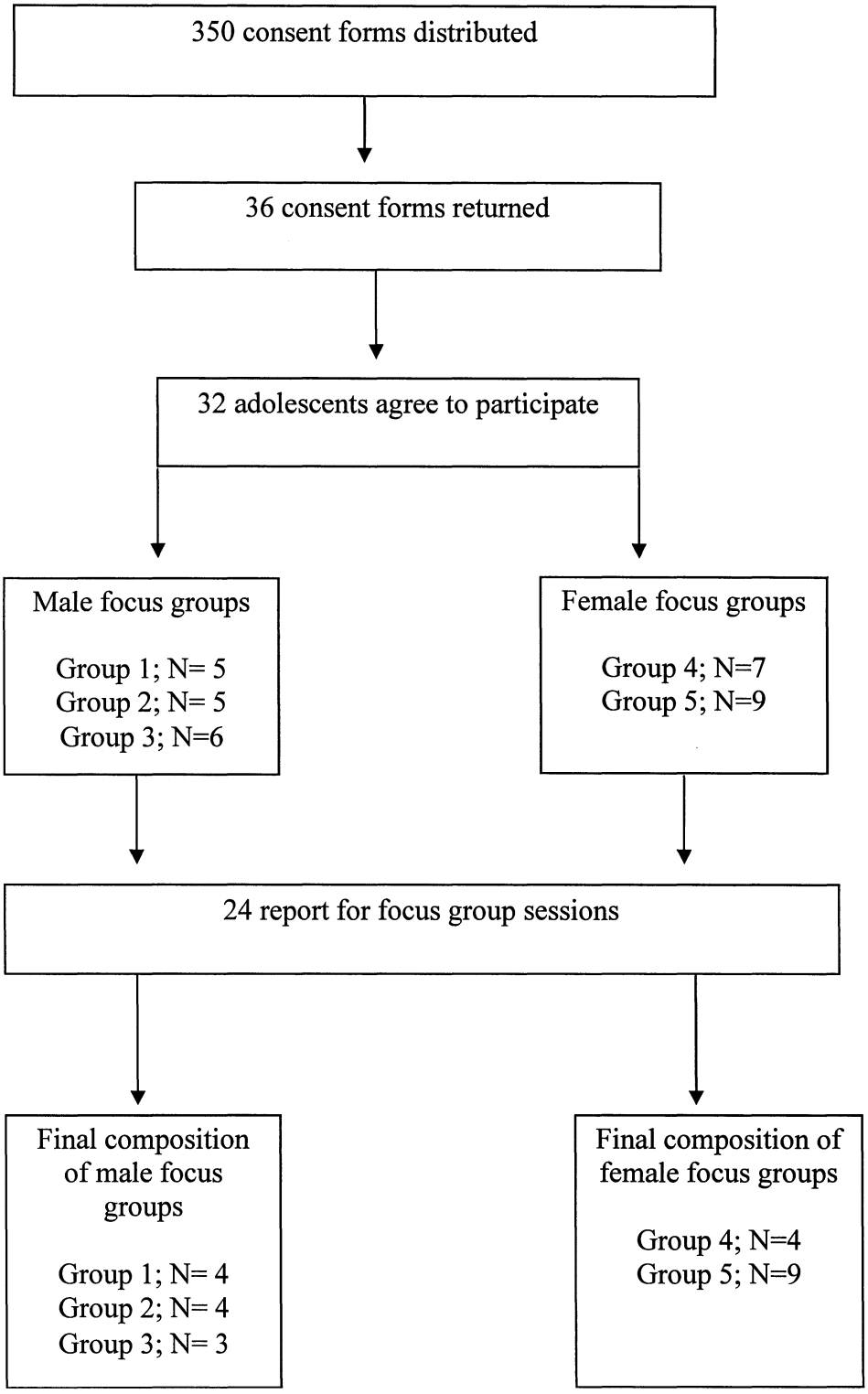

Figure 2. Flow of Study 1 participants through recruitment process.

4.4.3 Procedure

Prospective participants were contacted via telephone and asked to participate in focus group discussions about pain. From those agreeing to participate, adolescents were randomly assigned to same-gender groups. Random assignment ensured that "cliques" would not appear in the same group and groups composed of all girls and all boys ensured the elimination of any "peacock effects", or the tendency for males in the group to speak more frequently and with more authority than the females (Axelrod, 1975; Krueger, 1994). In addition, some gender-specific pain issues (e.g., menstruation) were anticipated to cause some discomfort in the presence of the opposite gender.

Participants met at the meeting facilities of a local mall or on school premises for the focus group sessions. A short questionnaire was developed to collect demographic data from all participants prior to the start of the focus group discussions (Appendix 4). The Pain Incident Questionnaire included items assessing the participants' age, grade, gender, number of pain episodes experienced over the previous month, type of pain most recently experienced, duration of most recent pain episode, intensity of most recent pain episode, existence of chronic or recurrent pain types, cause of chronic or recurrent pain types, frequency of chronic or recurrent pain types, whether or not prescription medications are taken for chronic or recurrent pain types, and if so, what type and dose. For female participants additional questions were asked regarding menstrual pain. All sessions were audio taped and later transcribed. Focus groups were run until data saturation occurred at the 5^{th} session.

4.4.4 Data Analysis

Demographic data collected from questionnaires prior to the focus group sessions were analyzed using SPSS 9.0 for Windows. The detailed codes for frequency and descriptive analyses can be seen in Appendix 5. Transcribed audiotapes of focus group sessions were analysed using qualitative content analysis (Flick, 1998). In this process, categories are brought to the textual data based on presumptions made from pre-existing empirical evidence and theory. Therefore the researcher may have developed hypotheses that are expected to emerge from the textual data, but does not necessarily confine the analysis of the textual data to those hypotheses. That is, although the categories through which the data are assessed may be conceived of *a priori*, the qualitative content analysis approach requires that the textual data are repeatedly assessed against the categories within which they are anticipated to fit, and categories must be refined or modified as necessary (Flick, 1998).

The purpose of the qualitative content analysis was to reduce the textual data to the central themes that most prominently emerged from the sessions. To this end, all transcripts were thoroughly and repeatedly read for content, context and flow. After the researcher was re-familiarized with the sessions, subsequent readings focussed on the emergence of themes represented in participant statements. These themes were assigned to broad categories which were subsequently narrowed in focus as additional statements contributed to the specificity of emerging themes. For example, a category initially labelled as "Does not like OTC medications" may have been further reduced to "Negative attitudes about OTC medications due to misinformation", as a result of more specific statements indicating the source of dislike for OTC medications. Only those categories that were represented by three or more statements were

maintained as recurring themes. Potential researcher bias and further refining of category development were addressed by having an academic supervisor review the textual data and categories.

4.5 Results

4.5.1 Prevalence of Pain

The prevalence of the adolescents' pain was obtained from the Pain Incident Questionnaire and is presented in Table 1. Male adolescents most frequently reported muscle and joint ache, as well as sprains as their most recently experienced pain type. Female adolescents reported muscle and headache most frequently, followed by menstrual pain, as their most recently reported pain type. Females reported experiencing more pain episodes than males within the previous month, however analysis using an independent samples t-test indicated that this difference was not significant, $t(22) = -1.50$, $df = 22$, $p = .15$; of those adolescents reporting pain intensity (1 male and 1 female were excluded from this analysis as they could not recall the intensity of their most recent pain episode) females rated their pain as being slightly more intense than males, however this difference was not significant either, $t(20) = -.40$, $p = .69$; and females' first line of treatment was an OTC analgesic, whereas males' first line of treatment was nothing or a physical method. In addition to menstrual pain, gender differences in most recently experienced pain types included female adolescents' reporting more incidents of head pain than male adolescents. Nevertheless, for both male and female adolescents, muscle ache was most frequently cited as the most recently experienced pain type.

Table 1

Pain Frequencies, Intensities, Types and Treatment Choices Among Male and Female Adolescents (N=24).

Adolescents reporting pain episodes	Mean pain episodes in last month (*SD*)	Adolescents reporting pain intensity	Mean pain intensity[1] (*SD*)	Types of pain[2]	Common Treatment[3]
Male (n=11)	5.18 (4.67)	Male (n=10)	5.50 (2.07)	Muscle ache, joint ache, sprains	None, rest, wrap, work out
Female (n=13)	9.92 (9.56)	Female (n=12)	5.92 (2.68)	Muscle ache, head ache, menstrual pain	Ibuprofen, none, doctor

1. Intensity was rated on a scale of one to ten where one = "not at all intense" and ten = "extremely intense.
2. Types of pain experienced within previous month in descending order of frequency.
3. Most commonly employed treatment employed in descending order of frequency.

4.5.2 Qualitative Results

Through qualitative content analysis of focus group transcripts, four major thematic categories emerged from adolescents' comments: (1) attitudes about pain and pain expression, (2) attitudes about pain management, (3) knowledge of pain management options and (4) social influences in pain management. Each of these major categories, as well as the sub-categories that emerged are discussed separately below. The notation used to describe individual participants' represents who the participant is and to which focus group they belonged. For example, "F1B1" represented "Focus Group 1, Boy 1" and "F3G1" represented "Focus Group 3, Girl 1". "M" represented the Moderator of the focus group sessions.

4.5.3 Attitudes About Pain and Pain Expression

Adolescents' attitudes toward pain emerged in statements regarding the context of their own pain expression, empathy for their peers' pain and tolerance of peers' pain responses and the way in which they discussed pain with their peers. Adolescents reported that pain was something to be endured, particularly if there was a threat of missing extracurricular activities. Where missing social activities or sport were of primary concern, adolescents reported masking their pain from authoritative others (e.g. coaches and parents). However, pain was taken more seriously by adolescents when there was a threat of continued or increased injury. In situations where pain was perceived as extreme or unfamiliar, adolescents recognized the importance of potential illness or further tissue damage and the necessity of informing their parents.

(A) Context of pain expression. Both males and females qualified the extent to which they expressed their pain overtly. It largely depended on one of two factors:

1. Reluctance to miss activities: Adolescents indicated that if there was an attractive activity they would tend to mask their pain so as to ensure their participation, e.g.,

> Moderator: "What if you came home from school with a headache, and there was a party or something at your friends' that night, that you were supposed to go to, or…would you tell your parents then?"
> F1B2: "No I'd just go to the party!"

Or;

> F3G2: "I went to volleyball practice, but I shouldn't have because I couldn't do anything. Like, I couldn't sit still because then it (menstrual pain) would hurt, but then I'd move around and it would still hurt, so I was like pacing the floor – and my coach thought I was crazy – so I probably shouldn't have gone, but I did anyways."

Or;

> F4B1: "…last year, someone skated over my finger and then I put gauze on it and used hockey tape to tape it up and I wanted to go back on but my coach said I couldn't. And I

got mad at him. (He) wanted me to come off but I just pretended it didn't hurt. But it was hurting."

2. Fear of personal injury: This keenness to participate in valued social activities was balanced by a personal assessment of the seriousness of the pain. For example,

F2B1: If I'm feeling sick, or in some kind of pain that I feel like I've never had it before, You know I'll kind of freak out about it like what's going on here, I'll just tell mom."

Or;

F5G4: "...like if it really hurts. If it hurts just, not much then you shouldn't (inform parents). If it really, really hurts than the person should go tell somebody – like their parents."

Or;

F2B3: "...but I know if I play (with a sprained finger), I'll hurt myself or whatever or make it worse."

(B) Empathy for and tolerance of peers' pain expression. Adolescents tended to legitimize their peers' pain expression in terms of whether they perceived that pain to be real or not. Clear distinctions were made between pain that was real and pain that was likely minor but exaggerated for the sake of attention-getting. Overall, adolescents expressed negative attitudes toward peers who complained about pain. For example,

F2B1: "Like if you sprain your finger or have mild pain and you just want to make a big deal out of it. Or you just put it in your head and your mind think it's pain. You just whine about it."

Or;

F2B3: "Well the real pain is something, is pain that everyone would feel. But wussy pain is something that one person would whine about and the other person would just sort of live with it."

Or;

F3G2: "My friend just complains about everything....it's usually little things that everybody has and she just complains so she can hear herself talk or something."

(C) Pain discussion among peers. Attitudes about pain were also apparent in how adolescents spoke to each other about pain experiences. Both boys and girls gave examples of talking with their peers about different pain experiences and how to manage them. For adolescent girls, pain was just another topic of conversation – little attention was paid to censoring ones' experiences or limiting discussions to those closest to them. For females pain talk was both within and between genders. For example, these two girls describe their talk:

> Moderator: "But you guys don't mind talking to each other about it (pain)?"
> F3G2: "No"
> Moderator: "What about talking to boys about it?"
> F3G2: "No, we talk about it all the time"
> F3G3: "…pretty much tell anybody, like we don't really care. We're not like – we can't tell the boys – cuz they understand"

For male adolescents, pain talk was largely within gender and the context of pain experiences largely influenced the extent of discussion. Although boys talked about pain with other boys, they were careful that they were not perceived as being soft. For example,

> F4B1: "It depends…sometimes if you, like if my friends are snowboarding and you go up to do a trick and you fall? Like, I just get back up and make it look like it didn't really hurt. But like, with basketball, and I got hit in the head with a ball, and it actually hurt, I'd have to go off. I wouldn't be like 'Oh, it doesn't hurt…it's all good…my eye is just bleeding'."
> Moderator: "Do boys talk to each other about different kinds of pain that they're experiencing, or is that not cool?"
> F4B1: "Yeh, all the time."

4.5.4 Attitudes About Pain Management

(A) Attitudes toward non-pharmacological pain management strategies. Both males and females discussed employing physical methods for recurrent pain. However, attitudes toward these physical methods were mainly negative. Even though physical methods were perceived as

ineffective, adolescent boys were more likely than girls to employ a physical method of pain relief first (see Table 1). Statements concerning physical methods of pain relief include:

> F1B2: "There's this thing that you get where you get a flannel blanket and you put this big bottle of ….. I don't know what it was…..on and it works for a real long time, you just put it on your arm and put the heating pad over it and it sinks in and takes down the swelling or something?
> Moderator: "And did it reduce pain?"
> F1B2: "Yeh, it kind of helped."

Or;

> F3G3: Sometimes ice and magic bags or whatever – I've used those before but they don't really work.

Or;

> Moderator: "What else (do you use for menstrual discomfort)? Hot water bottles?"
> F5G1: "I have, it doesn't really work."

Or;

> F4B1: "I get massages from my mother because my back is screwed up sometimes."
> Moderator: "So do you find massage works?"
> F4B1: "No."

(B) Attitudes toward OTC analgesics. Adolescents expressed a wide range of attitudes toward OTC analgesics and their use for pain. These attitudes were largely negative or cautious, although some adolescents did express positive or positive-cautionary attitudes as well. Negative attitudes were expressed in terms of the safety and chemical composition of OTC medication, the necessity of OTC medications in the treatment of pain and the effectiveness of OTC medications for the treatment of pain. Positive and positive-cautious attitudes ranged from having no problems with OTC analgesics at all to expressing the view that taking OTC analgesics to treat pain was better than enduring the pain by doing nothing at all. There were no obvious gender

differences in adolescents' attitudes to OTC analgesics. Both negative and positive attitude statements are illustrated below.

1. Negative: Adolescents' concerns about OTC analgesics generally centred on their chemical composition and the possible ill effects. For example,

F4B4: "...people are still working to find out stuff about them and see if they're bad for you or good for you. Most of the time, they're not good at all."

F5G1: "I don't like putting artificial stuff, like chemicals in my body."

In addition, they expressed certain doubts about the effectiveness of OTC analgesics and the fear that it could lead to dependence.

F5G1: "Some people take too much medication. Some of my friends have (ibuprofen) and they just take it for everything. They don't wait and see if their headache goes away or wait and see if they're just over-reacting or something. They just automatically take the (ibuprofen)."

F3G3: "...and usually if it doesn't actually work, you think it works – the pain goes away anyway, like a mental thing, y'know? Like those sugar caplets they used to give people and tell them it was medicine. I think a lot of the time, it's stuff like that."

2. Positive: Fewer adolescents expressed a positive view of OTC analgesics. Although some did have a generally positive view. For example,

F1B1: "They're fine. I don't have any real problem with them."

The more common view was "positive-cautious", for example,

F1B2: "I'd rather have no pain for a little bit, than have to NOT take pain killers and have pain all the time."

4.5.5 Knowledge About OTC Analgesics.

Discussions about what young people knew about OTC analgesics centred on how many or how much medication they should take. Many participants were unsure and indicated that they frequently ask their mothers to dispense the correct dosage at their request. Of those adolescents who independently medicated, dosing strategies were more often based on vague conceptions rather than concrete formulae. It is important to note that no adolescents referred to the actual amount of medication in terms of milligrams – dosing references were made in terms of the number of pills to be taken. The four main dosing strategies employed by those adolescents who expressed dosing views are presented as follows;

1. Label instructions: Clearly the most obvious way to determine the appropriate dose of medication is to read the label. Only one adolescent indicated that this was the most obvious method of determining dosage and the strategy they employed.

F5G3: "I just read the bottle."

2. Perceived effect of pills: There appeared to be little knowledge among adolescents that certain OTC analgesics are better suited to certain types of pain. Since adolescents' OTC analgesic choices were limited to the medications kept in the home, these medication were perceived as the analgesic that "works", regardless of pain type. For example,

F3G3: "I just take whatever seems to work. The only thing I have in my house is (ibuprofen), so…"

3. Size of pills: For some adolescents who still experienced difficulty in swallowing adult-size pills, the actual size of the pill took priority over the amount of medication

per pill. In these situations the ease with which the medication could be taken was indicative of how much medication was required. For example;

F5G6: "If they're extra strength, I just take 1 because they're too big to swallow anyway. But if it's (ibuprofen), I'll take 2 because they're so, like, small.

4. Age estimation: For some adolescents, age was perceived to be an important dosing criterion. While no direct link was made to age and physiology (e.g., liver functions) or age and body weight (i.e., for dosing on a per kilogram bases), some adolescents made vague connections from chronological age to amount of medication. For example,

F2B1: "For my age, I would say about one extra strength would do it for me for a couple of hours."

4.5.6 Social Influences in Adolescents' Independent Pain Management

Adolescents' comments regarding influential factors in their choices to self-medicate were organized into two major categories: parents and OTC analgesic use and peers and OTC analgesic use. The influence of parents emerged during focus groups discussions as more important than the role of peers with more parent-centred factors identified in the course of choosing pain management strategies. Both parent and peer factors are discussed separately below.

(A) Parents and OTC analgesic use. The role of parents in adolescents' OTC analgesic use was classified on four main dimensions: the availability of OTC analgesics in the home, adolescents' advice-seeking from parents, gender differences among adolescents in advice-

seeking from parents, and gender differences among adolescents in the advice given by parents for pain management.

1. Availability: Adolescents generally accessed analgesics used by their parents. Adolescents demonstrated awareness of the types of analgesics kept in the house, the sorts of pain that their parents frequently medicated for and what their parents used for their own pain management. Such awareness was captured in the following statements;

F5G6: "I use what my Mom has."

Or;

F3G3: "I just take it from the house because we have like, my Dad gets really bad migraines so we have thousands of bottles everywhere."

Or;

F4B3: "My parents have tons of medicine. And my Dad usually takes aspirin."

2. Approval and advice seeking: Although many adolescents reported that they do frequently self-medicate for a variety of pain types, they also reported frequently seeking either approval or guidance from their parents. Many adolescents reported that they independently self-medicated for recurrent pain. However they would let their parents know that they had taken medication after the fact. Most adolescents reported that if they experienced considerable pain that they had not experienced before they would talk to their mothers about what they should do. The following statements capture these trends;

F5G3: "I'd probably just let them know that I was going to get whatever I was going to take for the pain."

Or;

F2B1: "If I'm feeling sick, or in some kind of pain that I feel like I've never had before, y'know, I'll kind of freak out about it, like what's going on here? I'll just tell Mom to make an appointment for me with the doctor".

3. Gender differences in advice seeking: Admittedly, there was a clear gender difference with the girls being reluctant to discuss menstrual pain with their fathers. Although most male and female adolescents reported that their mothers were the primary source of advice on pain management and the dispensing of medications, it was only mothers with whom adolescent girls discussed menstrual pain. For example,

Moderator: "If you had really bad menstrual pain, would you tell your Dad?
F3G3: "No"
F3G2: "I would, but he'd probably just laugh at me"
Moderator: "But you'd tell your Moms?"
F3G3: "Yeh, I tell my Mom everything"

4. Gender differences between adolescents in advice given by parents: There were gender differences in what parents reportedly advised for their adolescents' pain management. Where boys were given pain management advice, options suggested were mainly physical. However, pain management advice given to girls was often pharmacological.

   F2B3: "My Dad tells me to ice stuff..."

   F1B3: "...if I'm playing hockey and I'm not playing very well, then my parents will ask me what's wrong, and then I'll just tell them, and then they'll just tell me 'we should go (to the physiotherapist) and see what's wrong'."

   F5G5: "My Mom gives (ibuprofen) to me."

   F3G1: "I just ask Mom, she'll say 'take some (ibuprofen)'."

(B) Peers and OTC analgesic use. The influence of peers on adolescents' self-medication was seen primarily through the availability of medications from peers. Since schools are not authorized to dispense any sort of medication to students, many adolescents carry OTC analgesics, as well as a variety of asthma medications, to school with them. This was particularly true for adolescent girls who reported that they carried ibuprofen or acetaminophen specifically for menstrual pain. Adolescents girls were also more likely than boys to know who else in school was carrying OTC medications, and reported asking peers for OTC analgesics when needed. For example;

F3G3: "Everyone has it if you need it."

Or;

F3G3: "…I take a bottle (of ibuprofen from home) and keep it in my bag."
Moderator: "Same as you?"
F3G2: "Yeh."

4.6 Discussion

4.6.1 Adolescent Pain Types

Adolescent males reported occurrences of muscle ache, joint ache and sprains where adolescent girls reported occurrences of muscle ache, headache and menstrual pain. The pain types reported during focus group discussions were consistent with those reported in the adolescent pain literature (Chambers et al., 1997a; Goodman et al., 1997; Campbell & McGrath, 1999; Goodman & McGrath, 1991; Unruh & Campbell, 1999). Although there were no significant gender differences in adolescents' reports of pain frequency or intensity, pain type did vary between genders. Gender differences in reported headache and migraine may be attributable to the rise and increased fluctuation of hormone levels in young girls during puberty (Silberstein

& Merriam, 1993). In addition to biological differences, differences in social display rules may account for gender differences in reported pain types. Where young girls are socialized to express pain more openly than young boys, the female adolescent in the present study may have felt more at ease reporting all pain types experienced (Zeman & Garber, 1996).

4.6.2 Attitudes About Pain and Pain Expression

Adolescents' attitudes toward pain and pain expression emerged through discussion about the context of pain, perceptions of peers with pain and discussion of how pain is talked about among peers. Attitudes about one's own pain were largely dependent on the perceived severity of the pain. Both male and female adolescents indicated that overt pain expression or reporting pain to their parents depended on the context of the pain experience. Where adolescents were concerned about missing social events or extracurricular activities, pain expression was minimized or concealed. Since adolescence is a time characterized by the acquisition of autonomy, with less time spent with parents and more time spent with peers, it is not unreasonable to assume that minor pain complaints would be concealed in order to secure the time that has been arranged to spend with peers (Larson & Richards, 1991). However, where adolescents' pain assessments yielded concerns of impending illness or aggravating an existing condition, thus causing more harm, adolescents were more likely to inform their parents about their pain. These distinctions of pain severity and the impending threats associated with perceptions of severity illustrate the cognitive development of adolescents and their increased understanding of the physiology of pain. By adolescence, young people have reached the formal-logical stage of cognitive development and understand pain within the context of its physical and psychological components. More importantly, they identify it as something that needs to be

resolved (McGrath & Craig, 1989). Since their understanding of pain is still somewhat inaccurate, unfamiliar pain experiences or experiences that are more severe than those that have been previously experienced are likely to cause alarm and result in the adolescent seeking assistance from their parents.

Adolescents possessed particularly negative attitudes about pain in the context of peer pain expressions. In particular, adolescents were intolerant of peers' overt expression of pain that was not perceived to be severe. Children's attitudes toward the legitimacy of pain, pain expression and relief from responsibility due to pain has been reported in the pediatric pain literature and implies similarly negative responses to peers responding to pain without organic cause (Guite et al., 2000).

Lack of empathy for peers expressing pain where such pain is perceived to be minor may have an impact on how adolescents talk to their peers about their own pain experiences. Both males and females reported talking to peers about pain and these discussions revealed important information about adolescents' attitudes toward pain and pain expression. Where females were likely to talk about their pain "all the time", males were more likely to use qualifiers; in particular, adolescent males tended to minimize pain that was the result of their own mishap, particularly when this pain occurred in the presence of their peers. For the adolescents in the present study, females felt more freedom to discuss all types of pain since most of the time there was an organic cause. However, males were more likely to distinguish between pain types regardless of organic cause. They would openly discuss only "real" pain (that with a legitimate cause) and remain quiet about, as one boy put it, "wussy pain" (pain from a mishap or clumsiness). The reluctance to speak about pain that is perceived to be less than legitimate (i.e.,

embarrassing) may be explained by gender role expectations and social display rules. Males may be cautious about expressing pain behaviors among their peers so that they do not appear to be weak. Conversely, females are socialized to be supportive about pain, express pain behaviors and openly discuss pain (Klonoff, Landrine & Brown, 1993; Koutantji et al., 1998; Wise et al., 2002; Unruh, 1996, Zeman & Garber, 1996).

4.6.3 Attitudes About Pain Management

Adolescent males were more likely than females to employ physical methods of pain relief as their first course of action. However, both males and females felt that physical methods of pain relief were not particularly effective. Perceived ineffectiveness of physical methods of pain relief has been reported elsewhere (Campbell & McGrath, 1997). Consistent with the existing pain literature, females were more likely to self-medicate for pain, some of which was menstrual (Chambers et al., 1997a; Unruh & Campbell, 1999). Both males and females indicated ease of access to OTC analgesics either in the home or, for females, from peers. Availability of OTC analgesics in the home is also apparent in the paediatric pain literature (Chambers et al., 1997a; Sloand & Vessey; 2001; Stoelben et al., 2000).

For the most part, adolescents expressed negative attitudes about OTC medications with references to "chemicals", "artificial stuff" and on-going safety testing, however these attitudes did not appear to be based on personal experience or hard fact. Nor did these attitudes seem to affect the pain management strategies chosen by adolescent girls. For girls, even though negative attitudes were expressed, they were still more likely to employ a pharmacological strategy first for pain relief. These negative attitudes may be due, in part, to the heavy exposure adolescents experience about the dangers of illicit drugs, however such a conclusion is speculative (McGrath,

1996). Negative attitudes about illicit drugs may possibly transfer to negative attitudes about all medications. Anecdotal evidence suggests that adolescents avoid using opioids for pain relief because of misinformation about the risks associated with their use (McGrath, 1996). For some male adolescents there may have been confusion between the perceived risks of OTC analgesics and those associated with prescription medications. One adolescent male in particular, voiced concerns about the most unlikely side effects when using OTC analgesics. Further discussion revealed that his concerns were based on television advertisements he had seen for prescription medications where lengthy descriptions of all possible side effects are announced.

4.6.4 Knowledge of OTC Medications

Although adolescents reported either asking their parents for the correct amount or reading the label on the bottle, independent dosing decisions appeared to be made on irrelevant factors like size of pill. These adolescents appear to be making their own decisions and developing their own attitudes about OTC analgesics, but they do not appear to have the necessary knowledge base to do so. Lack of awareness about OTC analgesic uses and awareness of harm issues has been reported for older adolescents as well as young adults (Huott & Storrow, 1997; Myers et al., 1992; Scholder-Ellen et al., 1998; Sloand & Vessey, 2001; Stoelben et al., 2000).

4.6.5 Social Influences in OTC Medication Use

Parents emerged as the primary social influence in adolescents' use of OTC medications. Most adolescents reported consulting their parents for advice about how to treat a pain episode or were asked by adolescents for OTC analgesics for their pain. Even among those adolescents who reported that they self-medicate independent of their parents, most reported that they informed

their parents that they had taken an OTC analgesic for a pain type. This finding may be indicative of the transitory nature of acquiring health-related independence during adolescence. McGrath and Craig (1989) note that although adolescents have achieved an understanding of the physiology and psychology of pain, their knowledge has not quite approached the adult level. This has been illustrated in the dosing strategies employed by adolescents as well as their dependence on parents for assistance when pain is perceived as severe. Although adolescence is a time where autonomy from parents is a primary goal, adolescents may appreciate that in matters of health and wellness, parents are more knowledgeable. The advice-seeking (i.e., asking parents what to do for pain) and approval-seeking (i.e., informing parents of medication use after the fact) may be part of the adolescents' attempt to gain independence in their own pain management via information gathering from parents about appropriate medication use.

The only obvious gender difference among adolescents for advice-seeking from parents was in the case of menstrual pain. Although most adolescents reported that they went to their mothers when they were experiencing pain, adolescent girls went to their mothers exclusively when the pain was menstrual. Gender differences were also apparent for the pain management advice dispensed by parents. Regardless of the gender of the parent, boys were advised to employ physical strategies for pain relief whereas girls were advised to use an OTC analgesic. These findings should be approached with caution however, since the pain episodes related to these findings were different for both boys and girls. Where boys were advised to ice or wrap a pain site, the injury incurred was sports-related. Pain episodes for which girls were advised to medicate were mostly menstrual. Chambers et al. (1997a) suggested that gender differences in medication use may be attributable to the generalization of menstrual to other types of stomach

pain. Nonetheless there may be evidence for mothers generalizing their adolescent girls' pain from menstrual discomfort to other types of pain. Habitual use of analgesics by women for menstrual pain is reportedly maintained through the negative reinforcement of pain reduction and analgesic use may generalize to other non-menstrual pain symptoms (Hart & Hill, 1997). This generalization may be true for mothers of adolescent girls and influence how they recommend their daughters manage their menstrual pain.

Another parental influence on medication use among adolescents was apparent in the availability of OTC medications in the home. The most cited reasons for using a particular medication were availability of that medication in the home and awareness of a parent employing the same strategy. The existing pain literature demonstrates that, for adolescents, pain management choices are often facilitated by the availability of medications in the home (Chambers et al., 1997a; Sloand & Vessey, 2001; Stoelben et al., 2000). Such facilitation is either direct (from parents) or indirect (from the medicine cabinet). Observational learning was also an important factor in adolescents' medication choices. Adolescents often reported that they simply took what their mothers or fathers took, indicating awareness of parents' pain management as a result of repeated exposure. In the family context, children are exposed to countless episodes resulting in either their own pain experience or that of others. With each observed episode of a parent's pain experience, children learn how to respond to and cope with pain (Craig, 2002). Observational learning and parental modelling has been demonstrated for somatization in children with recurrent abdominal pain (Walker et al., 1991), concordance between parent and child reports of pain and pain intensity in a community sample (Goodman et al., 1997) and children's responses to experimental pain (Goodman & McGrath, 2003). Studies

investigating menstrual pain indicate that adolescent girls report learning physical and psychological strategies for menstrual pain relief through their mothers (Campbell & McGrath, 1999). Observational learning and parental modeling may be an important mechanism in adolescents' acquisition of knowledge about various pain management strategies.

Where peer influences in OTC medication use were considered, there were clear gender differences in medication availability. Most notably, females were more likely to carry OTC analgesics in their backpacks and share them with their friends because "we get menstrual pain." The "norm" for girls to carry OTC analgesics to school may be related to analgesic use persisting beyond the normal duration of discomfort (Hart & Hill, 1997) and the generalization of menstrual pain complaints to other types of pain (Chambers et al, 1997a). However, school policy may likely be influential in adolescent girls' choice to carry OTC medications to school; in both of the schools participating, OTC analgesics were not allowed to be provided to children by teachers or administrators.

4.7 Summary

Taken together, the themes emerging from the peer focus group data provide the groundwork from which speculations about adolescents' independence toward pain management is achieved. The most recent pain types experienced by adolescents in the present study were consistent with those outlined in the pain literature and experienced within a complex social context. Five major conclusions can be drawn from this. Firstly, how pain was experienced appeared to be influenced by past experiences with pain episodes (familiar discomfort versus episodes perceived to be severe) and the context in which the pain was experienced (e.g., as a result of mishap, as a result of legitimate injury or organic cause). In addition, adolescents took

into consideration the context of the pain experience and the costs related to expressing pain overtly. Where favoured activities would likely be missed, adolescents were more likely to dismiss their pain or hide it from others. If there was a fear of further harm, adolescents were more inclined to take action by informing their parents or restricting potentially harmful activities. Secondly, pain expression emerged as a function of social display rules, particularly for boys, and clear negative perceptions of overt pain expression for pain types without perceived severity were apparent in both male and female adolescents.

Thirdly, peers emerged as an important influence in the expression of pain through talk and behavior. Through their peers, adolescents seemed to acquire many of their attitudes about pain and pain behaviors. For adolescent girls, peers were an important means of access to OTC analgesics, and likely a source of implicit approval for OTC analgesic use. However parents, in particular mothers, were the primary influential source for acquiring information about pain management. Fourthly, although many adolescents attempted to exercise autonomy in their pain management, mothers were frequently consulted about medication use. This trend demonstrates a transition period for adolescents in their attempts to achieve independence in managing their pain. Although these adolescents were cognitively aware that their pain was something to be dealt with, they had not achieved a level of understanding comparable to that of an adult. This was evidenced by their vague conceptions of appropriate medication dosing and their tendency to treat their pain with whatever analgesic was currently available in their homes. And finally, adolescents' attitudes toward OTC analgesics were somewhat cautious and negative, and often uninformed. Nonetheless, use was pervasive, although more so in girls.

The findings from the focus group sessions informed the focus and direction of Study 2.

Since the social influences of parents were clearly apparent in terms of advice-seeking, observational learning and modeling of pain management behaviors, Study 2 set out to determine how parents influence adolescents' acquisition of attitudes and beliefs about pain, pain expression and pain management.

CHAPTER 5

Study 2: Adolescents' Acquisition of Attitudes and Beliefs About Pain and Pain Management; The Role of Parents

5.1 Introduction

The findings from study 1 informed the direction of this study. Although the influence of peers in the expression of pain behaviors was quite apparent, parents emerged as influential in adolescents' access to OTC analgesics, dispensing information about medication type and dosing, and serving as models for adolescents' pain management choices. The primary purpose of this study was to explore more deeply how attitudes, beliefs and behavior towards pain and pain management strategies are transmitted to adolescents, via their mothers, within the family context and to understand how proximity and shared social environment influence adolescents' pain experiences and pain management choices.

5.2 Background

5.2.1 Maternal Influences on Pain Behaviors

Modelling of pain behaviors is widely supported in the literature. For example, children with recurrent and unexplained pain report more "pain models", such as parents, siblings and peers, and similarities in pain intensity and frequency with those models than children with recurrent pain explainable by disease (Osborne, Hatcher & Richtsmeier, 1989). In lab-based studies with healthy children and children suffering from juvenile arthritis, findings have been similar; reported pain intensity, threshold and tolerance are similar among parent-child dyads (Thastum, Zachariae, Scholer, Bjerring & Herlin, 1997). Mothers' responses, in particular, to

their children's pain episodes have been shown to have an impact on how children learn about pain and pain behavior (Chambers et al., 2002; Goodman & McGrath, 2003).

5.2.2 Modeling and Attitude Development

The family is a constant source of influence on children and cannot be ignored as a prominent source from which adolescents learn about pain and pain management. Both professional opinion and psychological theory indicate that the family plays an important role in influencing children's pain experiences (Craig, 1983; 1986). Parental pain incidents provide children with multiple opportunities to model their own pain behaviors, particularly where parental pain episodes are frequent (Campbell, 1978; Goodman et al., 1997). Although the same mechanisms are expected to apply to adolescents' acquisition of pain management behaviors and attitudes, no known research has addressed the role of parental modeling in the intergenerational transmission of information about attitudes and behaviors surrounding pain management choices.

5.3 Study Objectives

The purpose of this study was to (a) describe the pain types experienced by both mothers' and adolescents (b) to assess mothers' attitudes toward pain and pain management for both themselves and their children (c) to determine how attitudes, beliefs and behavior towards pain and pain management strategies are transmitted to adolescents, via their mothers, and (d) assess similarities between mothers and adolescents with respect to pain episodes, attitudes toward pain and pain management, and pain management practices employed.

It was hypothesized that mothers' attitudes toward OTC analgesics for the management of their children's pain would be largely negative. In addition, it was expected that mothers would have a profound effect on adolescents' acquisition of attitudes about pain and pain behaviors, as

well as adolescents' knowledge of pain management options. The primary mechanisms by which this information was transmitted were expected to be modeling and verbal communication.

5.4 Method

5.4.1 Design

Adolescent-mother dyads were interviewed to (a) understand mothers' attitudes toward pain and pain management strategies, as well as their knowledge of various pain management strategies and preferred pain management choices, and (b) determine how this information is transmitted to adolescents by assessing mechanisms of information transmission within adolescent-mother pairs. Face-to-face, semi-structured interviews were chosen to ensure that the full range of information was made accessible. In employing semi-structured interviews, the researcher works out a set of relevant questions in advance but is given the freedom to deviate from the order in which those questions are asked or to eliminate or add questions based on the flow of conversation and the information forthcoming (Robson, 1993). Considerations undertaken for carrying out the semi-structured interviews were similar to those considerations made for focus groups discussions. A trained interviewer, with experience in interviewing both adults and children engaged participants in informal conversation about pain and pain management.

The questioning sequence for the semi-structured interviews followed the format suggested by Robson (1993). Sessions began with an introduction outlining the purpose of the study and a reminder that the sessions were being taped. This was followed by "warm-up" or easy questions that gradually merged into the main body of the interview. After the main portion of the interview was completed, the interviewer concluded with "cool-off" questions designed to

be straight-forward and recap the information already obtained in the main body of the interview. Finally, during the "closure" of the interview, the interviewer thanked the participants for their time, asked them to mention the study to any acquaintances they thought might be interested and then engaged them in everyday conversation that was irrelevant to the interview topic. Adolescent interviews were kept as brief as possible since their attention span is limited and boredom often interferes with the acquisition of information (Krueger & Casey, 2000). Two sets of interview questions were designed, one each for mothers (Appendix 6) and adolescents (Appendix 7). The subject matter was similar in both sets, however the wording differed as a function of the individual being interviewed. As was the case for focus groups sessions, probes and prompts were incorporated into the interview schedule.

5.4.2 Participants.

Participants were 7th-, 8th- and 9th grade students, and their mothers, from a junior high school in St. John's, Newfoundland. Approval for the conduct of this study was initially obtained from the university ethics review boards of both Dalhousie University, Halifax, Nova Scotia (see Appendix 2) and Memorial University of Newfoundland, St. John's, Newfoundland (see Appendix 8) as well as school principals and teachers. Three weeks before the study began, consent forms describing the study (see Appendix 9) were distributed for students to give their parents. Consent was required for parents' participation and both parental consent and child assent were required in order for adolescents to participate. Participants were compensated for their time with movie video vouchers.

The flow of prospective participants through the recruitment process is outlined in Figure 3. The final sample consisted of 20 parent-adolescent dyads made up of 20 mothers ($M = 42.72$

years; $SD = 5.42$), 10 male adolescents ($M = 13.6$ years; $SD = 1.43$) and 10 female adolescents ($M = 13.4$ years; $SD = 1.07$).

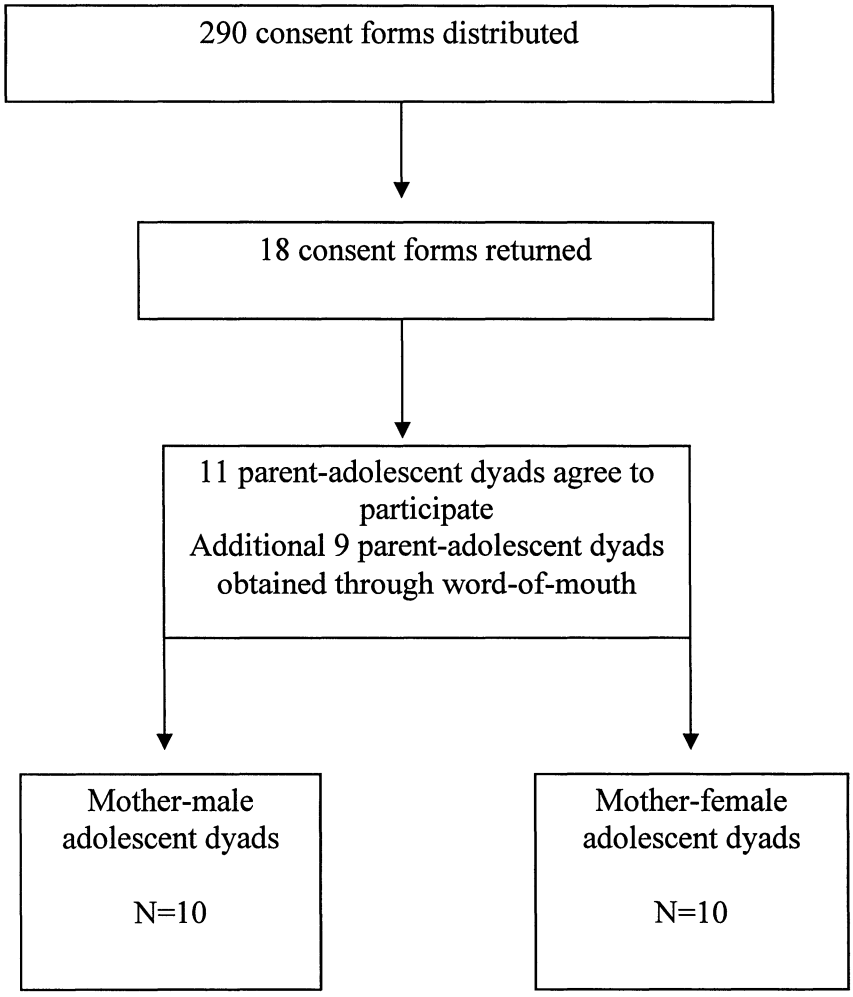

Figure 3. Flow of Study 2 participants through recruitment process.

5.4.3 Procedure

Prospective parent-adolescent dyads were contacted via telephone and asked to participate in informal interviews about pain. Contact was first made with the parent and times were set up to accommodate both parent and adolescent.

A trained research assistant met with each mother-child dyad in their home and conducted interviews with the parent and child separately. The Pain Incident Questionnaire (see Appendix 10) was developed to collect demographic data from all mothers and adolescents prior to the start of the interviews. Items on the questionnaire included the participants' age, grade or occupation, gender, number of pain episodes experienced over the previous month, type of pain most recently experienced, duration of most recent pain episode, intensity of most recent pain episode, existence of chronic or recurrent pain types, cause of chronic or recurrent pain types, frequency of chronic or recurrent pain types, whether or not prescription medications were taken for chronic or recurrent pain types, and if so, what type and dose. For female participants additional questions were asked regarding menstrual pain (See Appendix 10). All interview sessions were audio taped and later transcribed.

5.4.4 Data analysis

Data analysis has been described in Study 1 (section 3.2.1). In addition, individual adolescent-mother pairs were assessed in order to determine direct links, via correlation, between mothers' pain and pain management attitudes and practices and those adopted by their adolescent children.

5.5 Results

5.5.1 Quantitative findings

Dyadic data analyses were conducted on demographic information obtained using descriptives, frequencies and, where applicable, Chi square and correlations. Demographic and prevalence findings are reported in the section following.

5.5.2 Prevalence

The prevalence of the mothers' and adolescents' self-reports of pain is presented in Table 2. For all participants, headache was the most frequently reported pain type. For male adolescents, the most frequently reported pain episodes after headaches were those associated with physical strain, such as muscle ache, joint pain and sprains. For female adolescents, the most frequently reported pain episodes after headaches were acute pain episodes, pain associated with physical strain and stomach ache. For mothers, the most frequently reported pain episodes after headaches were pain associated with physical strain, menstrual pain and acute pain episodes. Male adolescents averaged 1.50 pain episodes with a mean intensity of 5.10 (out of 10) during the last month whereas female adolescents averaged 5.40 pain episodes with a mean intensity of 6.20. Parents averaged 3.05 pain episodes with a mean intensity of 5.10. With the exception of mothers' use of ibuprofen as their first course of treatment for menstrual pain, acetaminophen was the first treatment employed by all participants for their pain episodes.

Independent samples t-tests were conducted on adolescents' mean pain episodes and mean pain intensity of most recent pain episode in order to assess gender differences. With the exception of one female outlier who reported daily pain over the previous month, there were no significant differences in the mean pain episodes reported by female and male adolescents, t (18)

= -1.33, p = .20. Although there was a trend toward higher pain intensity ratings by female adolescents than male adolescents, this difference was not significant t (18) = -1.0, p = .33. Female and male adolescents' choices for managing their most recent pain episodes were similar. Aside from menstrual pain there were no gender differences in the types of pain experienced. There was full agreement between adolescents' reports and mothers' reports of their children's pain. That is, the pain episodes reported by adolescents were also reported by mothers when queried about their children's pain.

Table 2

Pain Frequencies, Intensities, Types and Treatment Choices Among Adolescents and Parents (N=40).

	Mean pain episodes in last month (*SD*)	Mean pain intensity[1] (*SD*)	Types of pain[2]	Common Treatment[3]
Adolescent				
Male (n=10)	1.50 (1.90)	5.10 (3.14)	Headache, muscle ache, joint pain, sprains, breaks, acute pain episode[5]	Acetaminophen, relaxation, tape/wrap, no treatment
Female (n=10)	5.40 (9.06)	6.20 (1.48)	Headache, acute pain episode, joint pain, muscle ache, stomach ache	Acetaminophen, no treatment, doctor, ibuprofen
Menstrual pain		4.0 (2.00)		Acetaminophen, nothing
Parent[4] (n=20)	3.05 (6.54)	5.10 (2.83)	Headache, joint pain, muscle ache, menstrual pain, acute pain episode	Acetaminophen, ibuprofen, combination acetaminophen or ibuprofen with rest, relaxation, exercise, no treatment
Menstrual pain		5.22 (2.06)		Ibuprofen, nothing, hot water bottle, acetaminophen

1. Intensity was rated on a scale of one to ten where one = "not at all intense" and ten = "extremely intense".
2. Most frequently reported "most recent" pain type experienced within previous month.
3. Most commonly employed treatment employed in descending order of frequency.
4. All parents interviewed were female; 19 mothers, 1 grandmother.
5. Acute pain episode is defined as sudden but brief pain as a result of falling or bumping into an object.

With the exception of one outlier who reported experiencing pain on a daily basis over the previous month, mothers reported anywhere from no pain episodes to two pain episodes. Type of pain experienced by mothers was similar to those pain types reported by adolescents except where mothers reported joint pain that was related to arthritis (n=3). Spearman's correlation coefficients were obtained between adolescents and mothers for number of pain episodes and pain frequency in order to assess similarities. There were no significant correlations between mothers' and male adolescents' reported number of pain episodes within the previous month (r = .104, *ns*), nor reported pain intensity of the most recently experienced pain (r = .127, *ns*). There were no significant correlations found between mothers' and female adolescents' reported number of pain episodes (r = -.071, ns), nor reported pain intensity (r = -.168, ns). Treatment choices for most recent pain episode were similar to that reported by adolescents. Seven of the twenty mothers reported chronic conditions such as arthritis, menstrual pain and stress/strain related pain. Six of these seven mothers were taking prescription medications for their pain. Twenty-five percent (n=5) of adolescents were aware of their mothers' pain episodes as indicated by references to mothers' pain during interviews; seventy-five percent (n=15) of adolescents reported that they were unaware of any pain experienced by their mothers. Of the seven mothers reporting chronic pain conditions, only three adolescents reported an awareness of their mother's pain episodes. The remaining four adolescent children of mothers reporting significant pain associated with a chronic condition were unaware of any pain experienced by their mothers.

There were no correlations between mother-daughter pairs' reports of menstrual pain (r = .218, *ns*) or menstrual pain intensity (r = .425, *ns*). Mothers' and daughters' management of

menstrual discomfort differed slightly; where adolescents reported using acetaminophen as their first course of pain management, mothers reported using ibuprofen first.

5.5.3 Qualitative Results

Qualitative content analysis of interview sessions organized mothers' and adolescents' comments into five major categories: (A) mothers attitudes about pain management strategies, (B) medicating behavior of adolescents, (C) talking to adolescents about pain management, (D) maternal transmission of information about pain and pain management in the family and (E) independence in adolescents' self-medicating behaviors. Each of these major categories, as well as the sub-categories that emerged, are discussed separately below. The notation used to describe individual participants' represents who the participant is and to which dyad they belonged. For example, "M9" represented "Mother 9" and "MA9" represented "Male Adolescent 9". Similarly, "M4" represented "Mother 4" and "FA4" represented "Female Adolescent 4". Mothers and adolescents who shared the same numeric identifier were from the same mother-adolescent dyad.

(A.) Mothers' attitudes about pain management strategies. Attitudes about pain and pain management strategies were sub-categorized across (i) attitudes toward OTC analgesics and (ii) attitudes toward non-pharmacological pain management strategies.

(i) Attitudes toward OTC analgesics. Mothers' attitudes toward OTC analgesics emerged in their discussions of their adolescent children taking OTC analgesics for their recurrent pain episodes. These attitudes were mainly negative. Mothers generally felt that their children were too young to be taking OTC medications and there were subtle implications that starting children on OTC analgesic use might turn into a common occurrence. Additional concerns were

expressed for the potential harm that OTC analgesic use may cause their children. These attitudes were expressed best in the statements that follow.

1. Age of child: Some mothers indicated reluctance toward giving their child OTC analgesics through vague references to their child's age. These statements indicated a concern for potential chronic use or concern that only older children require OTC analgesics to relieve pain. For example,

M7: "She just goes to bed (mother referring to what the suggests her daughter do for menstrual cramps). I don't really want to start giving her anything at this age."

Or;

M10: "I'll say, 'well take half of one (OTC analgesic for headache) and see how that helps and if that doesn't work, wait an hour and take another one – because I don't really want him to get into that yet…he's only a little boy."

2. Fear of harm: Although several mothers indicated concern about tolerance and side effects, one mother in particular was quite concerned about the potential side effects and toxicity of her daughter's chronic OTC analgesic use. For example,

M13: "She takes too many pain pills (mother referring to daughter's joint pain). I'm afraid she's going to end up hurting herself. But she says 'Mom, I can't go without it.'

(ii) Attitudes toward non-pharmacological pain management strategies. Mothers attitudes toward non-pharmacological pain management strategies were discussed in terms of their own experiences with such methods in the treatment of their own pain episodes. These attitudes were largely positive and expressed in ways that indicated the importance of minimizing potential side effects, employing preventative measures to ward off potential pain

episodes, effectiveness of the non-pharmacological strategies employed and reducing chronic medication use, or "pill popping." These attitudes are illustrated in the statements that follow;

1. Fewer side effects: Mothers felt that herbal or physical remedies were better than OTC medications since they were associated with fewer side effects.

M1: "...because the medication most of the time have side-effects or possibility of side-effects, whereas the herbal ones, unlikely they do and very unlikely that they're going to cause any other damage."

2. Prevention: Mothers often referred to preventative measures as the primary method to avoid pain and circumvent subsequent pain management with OTC analgesics.

M12: "Most often I have massage therapy done...now I go for preventative more than, I used to go just when I got the pain. Now I go and have it done once a month."

3. Effectiveness: The perceived effectiveness of non-pharmacological strategies, particularly when paired with physical strategies, contributed to mothers' positive attitudes about alternative pain management strategies.

M13: I started on glucosamine, started exercising...and the two of it...it's (knee pain) under control."

4. Decrease medication consumption: The desirability of reducing ones' consumption of medications was expressed as a positive consequence of employing non-pharmacological strategies in pain management.

M4: "I've learned other means than just popping pills. I'm very keen to have reflexology or...hydrotherapy baths and stuff like that. I think I'm more proactive into that side of it, so hopefully if I take care of me physically, then maybe I won't use as much medication."

(B) Medicating behavior of adolescents. The medicating behaviors of adolescents were further sub-categorized into (i) how adolescents take pain medication and (ii) mothers' perceptions of how adolescents take pain medication.

(i) Adolescents taking pain medication. Adolescents described how they take pain medications in terms of independence, parental approval or a combination of the two. Adolescents who sought their parents' approval prior to self-medicating or used a combination of independent and parent approved medicating appeared to do so in order to ensure that they were doing the correct thing or to inform parents of what they had already done to alleviate their pain so that their parents could make better informed choices regarding how to proceed with their adolescent's pain management. These patterns of medication were also apparent in Study 1 and are described below.

1. Independent self-medication: Several adolescents indicated that they self-medicated for pain without asking their parents. Some adolescents also made reference to what OTC analgesic they administered for certain pain types and what dose they took, although references to dose were admittedly vague. For example,

MA6: "I take a couple of acetaminophen…I get it myself."

Or;

MA9: "I (took) ibuprofen (for a headache)…sometimes I just go and get it myself."

2. Parental approval: Several more adolescents indicated that they never took OTC analgesics without first checking with their mothers. Adolescents who sought their parents permission before taking OTC analgesics indicated a cautious approach to OTC

analgesic use where appropriateness of use is assessed and parents monitor the dispensing of medications. For example,

FA11: "Usually I ask my Mom first, to make sure it's a good idea."

Or;

FA15: "I normally go to Mom or Dad…and ask her to get me acetaminophen."

3. Combination: Most adolescents indicated a combination of independence and parental approval. In most situations, adolescents asked their parents for OTC analgesics, however when parents were not present at the time of the pain episode, adolescents indicated that they would self-medicate with a small dose. Cautious OTC analgesic use was also expressed among adolescents who employed a combination strategy in their pain management. When they had already self-medicated but their pain was not relieved, adolescents would obtain parental approval before medicating again. For example,

MA3: "I ask Mom if I should take one or not. If they're not home I just take one or 2. (Then) I'll tell them that I took 2 acetaminophen because I had another headache again tonight and she (Mom) said 'take acetaminophen'. I said 'I've already took 1 today, so should I now?'

MA20: "I usually take acetaminophen (for headache) and relax…whenever I take acetaminophen I usually tell my Mom or somebody."

(ii) Mothers perceptions of adolescents pain management. Mothers perceived their adolescents' pain management as either fully independent, a learning process toward independence or a process that could be partially independent with parental monitoring. The general view however, appeared to be that adolescents are indeed approaching an age of complete independence when it comes to their own pain management. The extent to which this

independence had been achieved or was being facilitated is illustrated in the following statements.

1. Independence: Several mothers reported that their adolescent children frequently self-medicated for recurrent pain without the assistance of their parents. These mothers also reported confidence in their children's appropriate use of OTC analgesics. Nonetheless, mothers reported qualifiers; if independent attempts at pain relief failed, adolescents would seek out their parent's assistance and where narcotics were involved, parental assistance would be a must.

M4: "She's wise enough to self-administer the right medication…she knows she can take one now and if in an hour this is not better, she can take the second one. If after that, it's not better and she's still feeling miserable…phone Mom or Dad."

Or;

M1: "Normally he'll take it himself, but sometimes he'll come to me and say 'Mom, my headache is tormenting me and I'm going to take this (OTC analgesic)'."

Or;

M4: "I don't have any fear that she will (over-medicate with OTC analgesics). Now if this was a prescribed medication, like a narcotic…I wouldn't do it."

Or;

M8: "I was concerned when she was younger. She self-administers now but I'm not concerned. She's practically an adult now."

2. Learning: Some mothers reported that their adolescent children had had sufficient experience with recurrent pain types and the management of those pain episodes that they had sufficiently learned when and how to take OTC analgesics for their pain

relief. Admittedly, there appeared to be learning curve involved, as mothers reported that although their adolescent children were capable of self-medicating, they still frequently asked for guidance.

M17: "She knows herself, but where she also has her monthly pain with her tightening of her braces, she's learning better to cope and take what she needs. She knows what she's allowed to have. She knows how often, though she'll always check with us first. She'll call and say 'my mouth is bothering me. Can I take some acetaminophen?', 'Have you taken any?', I took 2 four hours ago', 'You have to wait another 2 hours before you can have any'. She knows that because she's also learned to…over the course of the last few years when you're having continuous pain, that it is very, very important in the control of it that medication as prescribed is taken right on time."

3. Monitoring: Some mothers reported allowing their adolescent children to take responsibility for their own medications, but monitored appropriate use by checking their pill containers to ensure that the medication had indeed been taken.

M2: "…what I'll do – every week, I'll just fill up this (pill container). If I come home in the night and see that the pills aren't there, I'll go down and wake him up and give it to him…oh, I watch it."

Or;

M4: "…even an antibiotic I'll say 'okay guys, you've got strep throat…there's your antibiotics. You've got to take them 4 times a day. We're going to set it up 10am, 2pm, 6pm and 10pm.' They're responsible for it and I can (check) the meds."

(C) Talking to adolescents about pain management. Many mothers reported that pain management had been discussed with adolescents in the home. Topics of discussion appeared to have less to do with direct talk about proper use of medication or dosing information and more to do with issues of safety, prevention and pain management alternatives. Statements illustrating these topics are presented below.

1. Safety: Safety issues appeared to be less about OTC medication per se, but rather about the dangers of taking unknown medications from people other than direct family members.

M4: "I've been really aware of saying to them 'don't go to school and say you have a headache and take a pill from somebody'.

2. Prevention: Mothers were aware of the media messages adolescents are exposed to about the merits of both prescription and OTC medications. As a result, there appeared to be concern about adolescents assuming too quickly that a pain episode requires medicating.

M20: "I think there's a lot of advertisements facing them and everything…(son) will get headaches…I tell him lots of times that it's just because he's dehydrated – I notice that he'll get a headache after he's been going mad all day. He wants to be outdoors all the time…if it's a really hot day – 'here's a bottle of water'. These are the kinds of discussions we've had and I think they (children) are very conservative about what they take for anything that's wrong with them."

3. Advising: In family discussions about pain, mothers were likely to discuss their preferred method of pain management with their adolescent children.

M20: "I've talked to them before about (pain management)…and if he's (son) got a headache I'll tell him to…lie down and rest and you know relaxation or something like that, because I use these in my practices…so you know I think they're more tuned into that stuff perhaps."

Or;

M17: "Keep moving. That's the one thing we encourage – keep moving, keep going. The more you do the less you think about it.

(D) Maternal transmission of information about pain and pain management in the family.

Individual adolescent-mother dyads were assessed in order to determine how information about

pain and pain management is transmitted to adolescents by their mothers. Maternal transmission of information was further sub-categorized as (i) transmitting information through attitudes toward pain, (ii) transmitting information about pain management through practice, (iii) transmitting knowledge about pain management and (iv) parental modelling of pain and pain management.

(i.) Transmitting information through attitudes toward pain. Attitudes toward pain behavior were expressed by mothers, in largely negative terms. There was a tendency for mothers to express lack of sympathy for others' pain complaints and to consider themselves quite stoic in their own pain responses. Mothers also expressed positive attitudes toward coping by expressing a need to minimize their own pain expression in the family context out of concern that their behavior may negatively affect their children. This was particularly true for mothers with chronic pain conditions. Mothers' positive attitudes about coping with pain and how these attitudes were reflected in their children's statements about pain and pain expression are illustrated in the dyadic statements below.

> M9: "I'm not one for wimping…for pain…yeah, 'get over yourself'."
> MA9: "I just don't do anything (for muscle ache). I just get on with my life."

> M4: "I was really cognizant of the impact that a chronic condition (arthritis) can have on children. So regardless of how bad I felt or miserable I felt, I didn't talk about it because I didn't want them to be carrying this, thinking 'oh my God…Mom is sick and something is going to happen. I remember one day, (daughter) wanted a braid (in her hair) and the pain of doing those braids was like childbirth, because my hands were so bad…but I got her braids in…I wouldn't say 'I can't do your braids, my hands are bad.'".
> FA4: "She (mother) used to (suffer from arthritic pain) but I don't hear her complain about it a whole lot…I was really young when she had it. I remember her just like sometimes she couldn't make a fist – a tight fist – and just stuff like that. But like she hasn't talked about it for a long time."

(ii) Transmitting information about pain management through practice. Mothers' were largely aware of transmitting information to their children about pain management. This was particularly apparent among mothers who preferred preventative measures and non-pharmacological strategies for their adolescent children. The transmission of information about healthy lifestyle and non-pharmacological alternatives to pain management was apparent in the following statements from a mother-child dyad.

> M20: "I never really believed in having that (pain medications)…I tried to promote a healthy view that, you know, eat nutritiously and whatever…but it's interesting that dehydration – I think that is a factor (in causing headaches) but I don't think the public are educated in that. You don't hear that advertised do you? It's interesting how you pass it on to your kids…she (eldest daughter) has a really good view in terms of over-intervention…very conservative about it…not interested in all this jumping and giving someone this or that."
> MA20: "…Mom says drink water (for headache) and that, you know, that helps, but I…when it gets bad, I sometimes take ibuprofen or acetaminophen. She says get up and move around – try to work it off. Sometimes when it lasts, I'll take acetaminophen, I guess."

(iii) Transmitting knowledge about pain management. Many mothers indicated that their children's pain was something to be dealt with. They appeared to be keenly aware of a variety of pain management options that were appropriate for their children. Statements from mothers illustrating this trend are presented below.

1. Mothers' active information seeking: Through research and physician advice, mothers sought out as much information as possible before deciding on the best method of pain management to use with their children. For example,

> M2: "We used to not give him anything (for headaches) first starting. But then we went to the doctor. He said if you take something right away, then you've got a better chance of getting rid of it."

Or;

M13: "I've been thinking about putting her on glucosamine (for joint pain), it's an herbal remedy. I researched first, I always research first."

Where mothers obtained knowledge through research, adolescents' obtained knowledge primarily via parental assistance. Transmission of knowledge from mothers to adolescents was also apparent in adolescents' assistance-seeking; typically the information transmitted during assistance-seeking was information on what medications best treat particular pain types and dosing information. The transmission of this knowledge is presented in the dyadic statement below.

2. Type of medication: Several mothers were quite knowledgeable about what OTC analgesic was best suited for certain pain types. For some mother-child dyads, information about the type of medication to take to relieve specific pain types was successfully transmitted from mother to child. For example,

M1: "...but the muscle pain, I'll usually take ibuprofen because I always find that I have to determine first the type of headache or type of pain...and some things the ibuprofen works for and some things the acetaminophen works for."
MA1: "For a headache she'd (mother) say acetaminophen. But if it was a muscle thing, then she'd say ibuprofen. I've learned (what to take)."

3. Dosing: Both adolescents and mothers indicated the importance of taking OTC analgesics properly for maximum pain relief. When adolescents self-medicated and found OTC analgesics ineffective, they turned to their mothers for assistance with dosing. Most mothers were aware of the importance of proper dosing and dosing intervals and transmitted this information to their children. For example,

M6: "He (son) comes to me, and usually I have to say to him 'take a (acetaminophen)'. He says it doesn't help. (Maybe) if he takes them properly – you know – like 1 or 2 every 4 to 6 hours for, you know a day or something – maybe it will help."
MA6: "I take a couple of (acetaminophen)…sometimes I get it myself…Mom tells me (how much to take)."

Or;

M17: "That's the important thing, because if they say every 4 hours, you take it every 4 hours because if you take 4 hours then 6 then 8 then you never get it under control…"
FA17: "When I feel like I'm getting a headache, I just take something…so then it's not going to get worse…I read the label to know the amount and how often to take them."

(iv) Parental modeling of pain and pain management. Many adolescents demonstrated an awareness of their mothers' pain behaviors, suggesting that repeated exposure to such overt responses to pain could provide a source for pain behavior modeling. In addition, many mothers were aware that how they themselves coped with pain ultimately had an effect on how their adolescents dealt with pain. Evidence for potential parent modeling was most apparent in pain management strategies shared by adolescents and their mothers. Statements illustrating each of these points are presented below.

1. Adolescents' awareness of parents' pain behaviors: One adolescent indicated her awareness of her mother's chronic pain, and the similarities between her mother's and her own pain expression, with humour. For example,

FA13: "She (mother) has arthritis in one or two of her knees…she's in pain too. Like, two of us are like two crippled old women trying to walk around. She's limping with one knee. I'm limping with two knees…it's funny."

2. Mothers' awareness of their role as model: Several mothers were cognizant of the fact that however they themselves dealt with pain was likely going to be how their children dealt with pain.

M4: "I think that it (how parents cope with pain) comes back to the kids because they're not moaners…it's 'get on with it', do something and that's it."

3. Shared pain management strategies: Several adolescents indicated that the pain management strategies that they employed were those recommended to them by their mothers and employed by their mothers for their own pain relief. Adolescents who shared pain management strategies with their mothers also indicated that these shared strategies worked well for them. For example,

M4: "I try all other therapies first (for daughter's headaches) – dark room, cold cloth – you know, I've even gone as far as trying aroma therapy in the room. She has lavender candles and that sort of stuff in her room, so we try all that sort of stuff (before) we'll actually go to ibuprofen."
FA4: "I'll try and have a nap and if that doesn't work, I go to my Mom and she usually tells me to take an ibuprofen or acetaminophen and then I go to sleep again."

Or;

M12: "I think when they have pain we…I figure massage. The girls will go…every 2 months or so (for sports injuries). I think being in good shape, being physically fit is really important for prevention of the same injury."
FA12: "I had a skiing accident and I hurt my neck…I got massages, massage therapy done and I had some physio excercises, so it doesn't bother me anymore."

(E) Independence in adolescents' self-medicating behaviors. Many adolescents reported taking medication on their own for the treatment of pain and often were unaware of the concerns their mothers had for their safety. However some adolescents reported that they knew what to take and how to administer medications indicating a move toward autonomy in their own self-

medication practices. This trend was evidenced in the following statements from mother-adolescent dyads.

> M13: "She takes too many pain pills (mother referring to daughter's joint pain). I'm afraid she's going to end up hurting herself. But she says 'Mom, I can't go without it.'
> FA13: "I know now what to take…I don't over-dose. If I need only one or two, I take one or two. But if I need more, I take as many as I'm allowed (in accordance with directions)."

> M8: "…I was concerned when she was younger about…giving pain medication for headaches…that concerned me. She was iron poor…sometimes you wonder if it's all connected. She self-administers now, but I'm not concerned…she's practically an adult."
> FA8: "…Mom says get up and move around, try to work it off. Sometimes when it lasts (headache, menstrual pain) I'll take acetaminophen."

5.6 Discussion

The types of recurrent pain episodes reported by both adolescents and mothers were consistent with that reported in the literature (Campbell & McGrath, 1999; Chambers et al., 1997a; Goodman & McGrath, 1991; Goodman et al., 1997). Both adolescent males and females reported pain episodes resulting from headache, muscle/joint ache or acute pain episodes attributable to collisions or accidents while engaging in sports. With the exception of menstrual pain, no gender differences were apparent in adolescents' reports of recurrent pain. Mothers reported a wide variety of pain complaints associated with chronic conditions such as arthritis and migraine, in addition to less severe recurrent pain types like headache, muscle ache, non-arthritic joint pain and menstrual pain.

Qualitative data analysis indicated that mothers expressed positive attitudes toward non-pharmacological pain management strategies by expressing beliefs that herbal remedies had fewer side effects associated with them and that physical methods of pain relief such as massage

possessed preventative aspects. Those mothers who reported employing non-pharmacological pain management strategies also reported effectiveness of these methods in reducing their pain and functioning to decrease their medication consumption. Reasons for favouring non-pharmacological pain management strategies were suggestive of negative attitudes about OTC analgesics. Overtly expressed attitudes about OTC analgesics by mothers were largely cautious. Mothers were reluctant and cautious in their dispensing of OTC analgesics for their children's pain due to specific fears of harm and vague notions that administering OTC analgesics to young adolescents was an undesirable consequence of managing their children's pain. Negative attitudes toward OTC analgesics in treating children's pain has been reported in the pediatric pain literature. Forward et al. (1996) demonstrated that mothers' attitudes about the side effects associated with acetaminophen and concerns about tolerance and addiction caused 35% of mothers interviewed to consistently under-medicate their children for common childhood pain such as ear ache, head ache, muscle pain, injury pain and stomach ache.

Despite mothers' negative attitudes about OTC analgesics, both mothers and adolescents most frequently reported acetaminophen as their first course of action for most recent pain episodes. Apparent incongruency between attitudes and behavior was also reported by Forward et al. (1996); despite negative attitudes, 96% of mothers interviewed kept acetaminophen in the home and 75% had administered acetaminophen to their children in the month previous (Forward et al.1996). Similarly, quantitative data analyses indicated that 95% of the mothers in the present study kept, either acetaminophen, ibuprofen or both in the home and chose acetaminophen as their first course of action to treat their own pain. Adolescents also reported employing an OTC analgesic, usually acetaminophen, as their first course of pain management.

The textual data however, allows for a clearer picture of how mothers administer OTC analgesics in the treatment of their own or their children's recurrent pain. Most mothers, as well as adolescents, reported a more detailed step-wise process of pain management where OTC use was qualified as a last resort when other strategies failed.

Despite evidence in the pain literature for high prevalence of adolescents' independent self-medicating behavior (Chambers et al., 1997a; Rudolph et al., 1993), adolescents' patterns of self-medication were primarily parent-assisted. Although some adolescents reported taking OTC analgesics without parental approval, asking parents for OTC analgesics or informing parents of having taken OTC analgesics was the more commonly reported practice. These findings were also apparent in Study 1. Mothers appeared to be aware of how their children managed their pain. Reports of mothers' perceptions of adolescents' self-medication included acknowledgments of adolescents' independence and knowledge, however mothers qualified their children's independence and knowledge with statements about parental monitoring of medication consumption. These findings indicate that mothers are aware of their children's need to achieve autonomy in their own pain management, but likely recognize that their knowledge of pain and pain management falls slightly short of that of an adult (McGrath & Craig, 1989). The role of mothers in adolescents' transition from dependence to independence in pain management appears to be one of facilitator.

The transmission of information about pain and pain management was apparent in how mothers reported talking to their children about pain. Of primary importance when talking to children were issues about safety, prevention and dispensing advice consistent with attitudes. Mothers expressed concern about the hazards of taking medication from others, indicating an

awareness of peer pressure that may be facing adolescents when they are away from the home. According to Craig (2002), the intergenerational transmission of information about pain begins very early in the child's life with parents functioning as protectors to ensure children become aware of potential dangers via careful monitoring, guidance and safety promotion. This guidance prepares children to take on the responsibility of their own safety as they approach independence from their parents. In large part, mothers' talk centred around advising their children of preventative measures to minimize the occurrence of pain episodes and advising them to treat pain episodes in a manner consistent with their own personal attitudes and beliefs. How mothers reported speaking to their children about pain management was consistent with adolescents' reports of what their mothers advised them to do when in pain.

The present study deliberately employed mother-adolescent dyads in order to directly assess the intergenerational transmission of information about pain and pain management. Through the analysis of textual data from individual mother-adolescent dyads it was possible to speculate about how mothers transmit to their children and how the process is facilitated. Mothers provided adolescents with information about pain and pain management through their attitudes about pain, through their pain management practices, through their knowledge about pain management and by serving as models for their children's own pain and pain management behaviors.

The mechanism by which information about various aspects of pain and management were expressed was primarily verbal. Laboratory research investigating how mothers transmit information to adolescents experiencing experimental pain supports this (Chambers et al., 2000). The information transmitted centred around mothers' attitudes toward coping strategies for pain.

Several mothers, particularly those with chronic conditions, expressed disdain for others' overt pain behaviors as well as a preference to avoid overtly expressing pain themselves. Mothers of adolescents who did not frequently experience recurrent pain seemed to attribute stoicism to their adolescents' pain experiences. There was a common tendency for mothers to report that their children were not "one for popping pills" (M9) or to encourage adolescents to move beyond the pain by employing coping strategies such as ignoring the pain episode or keeping active in order to take the focus off the pain. These attitudes were also apparent in the statements of adolescents from adolescent-mother pairs. Where mothers talked about ignoring or getting over pain so did their adolescent children. Modeling research has indicated that where mothers minimize pain expression to experimental pain, so do their children (Goodman & McGrath, 2003).

Mothers with chronic conditions were particularly cognizant of the negative effects of overt pain expression in the family and made conscious efforts to minimize their pain behaviors or hide them completely in order to ensure that their children did not worry or become scared. Adolescents of these mothers who minimized their response to severe chronic pain episodes reported that they vaguely recalled their mothers having discomfort, but that they hadn't seen any overt expression of pain or heard any mention of the pain condition recently.

Parents also transmitted information about pain and pain management by expressing to their children the value of healthy lifestyle, preventative measure and pain management options. The transmission of information about knowledge of OTC medications primarily focussed on the importance of dosing and the importance of determining what OTC analgesic was best suited to treat specific pain types. Although most mothers and adolescents were aware that ibuprofen may be better suited for treating inflammation, adolescent girls treated their menstrual pain with

acetaminophen. Acetaminophen causes less stomach upset than ibuprofen, however, it is not as effective as ibuprofen in reducing the cramps associated with menstruation (Janbu, Lokken & Nesheim, 1979). However, of the ten adolescent girls interviewed, only five reported recurrent menstrual pain – three of whom treated their pain with OTC analgesics. The numbers are not sufficient to draw conclusions about adolescents' knowledge of ibuprofen versus acetaminophen for menstrual discomfort. Of the six mothers reporting recurrent menstrual pain for which medications were taken, four chose ibuprofen for pain relief.

Both mothers and children demonstrated awareness of the potential sources of parental modelling of pain behaviors and pain management strategies. Overt expressions of pain by parents did not go unnoticed by adolescents. Of those adolescents reporting an awareness of their parents chronic or recurrent pain, references were made to seeing their mothers (and in a few cases, fathers) limping, laying down to rest or verbally expressing discomfort. Mothers were aware that how well they coped with their own pain would ultimately influence how their children coped with pain. This was reflected in shared attitudes about coping strategies and shared pain management strategies.

5.7 Summary

The focus of the present study was to determine how adolescents acquire attitudes and beliefs about pain and pain management within the family by directly assessing links between mothers and adolescents. Study 1 described the importance of peers in the expression of pain through both talk and behavior and the importance of mothers for advice about medication use. However the social influence of mothers could not be assessed beyond anecdotal evidence for advice-seeking, observational learning and modeling of pain management behaviors. Through

the direct assessment of adolescent-child dyads, the data from Study 2 provided clear evidence of the role of mothers as facilitators of their adolescents' transition from dependent to independent pain management. In particular, mothers emerged as important sources of information about how to respond when in pain, how to prevent pain, how and when to use OTC analgesics and what pain management strategies to employ. This information, reportedly, was transmitted to adolescents both verbally and through observational learning and parental modelling.

From the findings of these qualitative studies we can begin to conceive of a psychosocial model of adolescents' transition toward independence in medicating for recurrent pain. For adolescents, personal history and past pain experiences are important in assessing the severity of pain. The context within which the pain is experienced, as well as a cost-benefit analysis of overt pain expression, will influence the expression of that pain. Peers are important in the expression of pain as well as the adolescents' developing attitudes about pain and pain management. Finally, mothers are of particular importance in the acquisition of knowledge about appropriate pain management and serve as facilitators of adolescents' transition to autonomy in pain management. The data from Study 2 suggest an association between mothers' pain and pain management experiences and how their adolescent children experience and manage pain. This was apparent in shared attitudes about pain expression, shared pain management strategies and mutual awareness of pain and pain management. Further, adolescents referred to their mothers as the reason for acquiring information about medication use, dosing, and non-pharmacological strategies and mothers referred to teaching their children about various aspects of pain management through practice or advice.

Taken together with the findings of Study 1, these data provide the information needed to assess attitudes toward pain and pain management strategies for adolescents and their parents in a quantitative design in order to generalize conclusions to a population and provide further evidence for a social-communications model of pain self-management in adolescence.

CHAPTER 6

Study 3: Similarities Between Parents' and Adolescents' Pain Experiences, Attitudes Toward OTC Analgesics and General Knowledge of OTC Analgesics

6.1 Introduction

The purpose of this study was to explore the attitudes, beliefs and practices of adolescents toward pain management strategies and to assess the similarities between adolescents and their parents on the same dimensions. Specifically, study 3 was designed to assess similarities in pain site, frequency and intensity between adolescents and their parents, similarities in pain management between adolescents and their parents, the extent of knowledge possessed by adolescents and their parents about pain medications and similarities between adolescents' and parent's attitudes toward pain medications. Where qualitative research is limited by the extent to which findings may be generalized, study 3 was designed to incorporate a research tool, developed from the information obtained in the first two studies, from which generalizablity might be established.

6.2 Background

6.2.1 Pain Prevalence

The present studies support the existing pain literature with self-report data indicating prevalence of recurrent pain types such as headache, muscle ache, joint pain, sprains, breaks, acute pain episode, stomach ache and menstrual pain. Adult pain prevalence has been reported similarly. In her critical review of gender variations in pain experiences, Unruh (1996) reported that the most commonly cited recurrent pain types for adults were headache and migraine, facial and oral pain, back pain, musculoskeletal pain and abdominal pain. Given that adult pain complaints are similar

to those experienced by adolescents, study 3 set out to establish whether or not there was a relationship between adolescents' and parents' reports of pain type, frequency and intensity.

6.2.2 Parents' Attitudes Toward Pain Medications For Children

Few studies have assessed parents' attitudes toward medications for children. However, the existing literature indicates that parents who are managing their children's post-operative pain or recurrent pain episodes consistently under-medicate for significant pain and interpret requests for more medication as a sign of addiction (Finley, McGrath, Forward, McNeill & Fitzgerald, 1996; Gedaly-Duff & Ziebarth, 1994; Knight, 1994). Lack of knowledge about pain medications is the most likely reason for ineffective pain management and unfounded concerns about side effects, addiction or tolerance (Chambers et al., 1997; Finley et al., 1996; Forward et al., 1996). However no known research has assessed the relationship between attitudes toward OTC analgesics and knowledge of OTC analgesics among parents.

6.2.3 Adolescents' Attitudes Toward Pain Medication

Although there is some data on mothers' attitudes toward pain medications for their children, no known studies have investigated adolescents' attitudes toward pain medications. What we do know is that OTC analgesic use is common among adolescents for the treatment of a variety of recurrent pain types, and that many adolescents manage their pain independently (Rudolph et al., 1993; Chambers et al.; 1997; Stoelben et al., 2000; Sloand & Vessey, 2001).

However, lack of knowledge may contribute to ineffective use of OTC analgesics for pain relief. The existing literature indicates that knowledge of OTC analgesics and their uses are lacking in both the adolescent and young adult population (Huott & Storrow, 1997; Campbell & McGrath, 1999; Stoelben et al., 2000). Lack of knowledge for harm issues among this age group

is concerning given the increased autonomy with which adolescents manage their own pain and access to OTC analgesics in the home. No known studies have specifically related adolescents' knowledge of and attitudes toward OTC analgesics.

6.3 Study Objectives

The purpose of the present study was to (a) apply the findings of studies 1 and 2 to a larger sample (b) assess similarities in pain site and treatment choice for adolescents and parents (c) assess the intergenerational transmission of knowledge and attitudes about pain medication between parents and adolescents (d) assess the relationship between knowledge about pain medications and attitudes about pain medications and (e) assess the relationship between attitudes about pain medications and pain management behaviors.

It was hypothesized that parents and adolescents would hold similar attitudes about pain medications and manage their pain similarly, that positive attitudes about pain medications would be related to knowledge about pain medications and that positive attitudes about pain medications would be related to medication use as a first choice for pain management at lower levels of pain intensity.

6.4 Method

6.4.1 Study Design

A telephone survey was developed and administered to a sample of parent-adolescent dyads via telephone. The advantages of the telephone survey method are (1) they are a simple method for acquiring large amounts of standardized information about attitudes and beliefs, (2) the interviewer can provide clarification and explanation on survey items (Robson, 1993). The survey administered in the present study (described in section 6.4.3) was developed based on the

results of the first two studies as well as similar questionnaires and surveys used in the pain literature.

6.4.2 Participants

Participants were 8th- and 9th grade students, and their parents, from five junior high schools in St. John's, Newfoundland and the immediate surrounding region. Approval for the conduct of this study was initially obtained from the university ethics review board at Dalhousie University (see Appendix 12). Additional approval was obtained from Memorial University of Newfoundland (see Appendix 13) as well as the school principals and teachers. Three weeks before the study began, consent forms (see Appendices 14 and 15) describing the study were distributed for students to give their parents. Parental consent and child assent were required in order to participate. Participants were compensated for their time with movie video vouchers.

The flow of prospective participants throughout the recruitment process is presented in Figure 4 below. The final sample consisted of 139 adolescents (50 male, $M = 14.24$ years, $SD = .89$ years, range = 13-16 years; 89 female, $M = 13.83$ years, $SD = .99$ years, range = 12-16 years) and their parents (6 male, $M = 46$ years, $SD = 2.61$ years, range = 41-48 years; 133 female, $M = 41.85$ years, $SD = 3.26$ years, range = 34-50 years). Although the primary interest in this study was mothers, 6 were unavailable at the time of the telephone interview and the fathers completed the survey. Since there were no significant differences between mothers and fathers across demographic variables, they were kept in the analysis. From this point forward, "parents" will refer to the 133 mothers and 6 fathers. The reader is advised however, that 95% of the "parents" were mothers. Twenty-three percent (n = 33; female) of mothers were homemakers while the remainder held occupations in sales (17.3%), health (9.4%), management (8.6%), government

(7.9%), financial services (6.5%), education (5%), administration (2.9%) and social work(1.4%). The remaining 15.8% classified as "other" worked as daycare workers, hairstylists and police officers, to name a few.

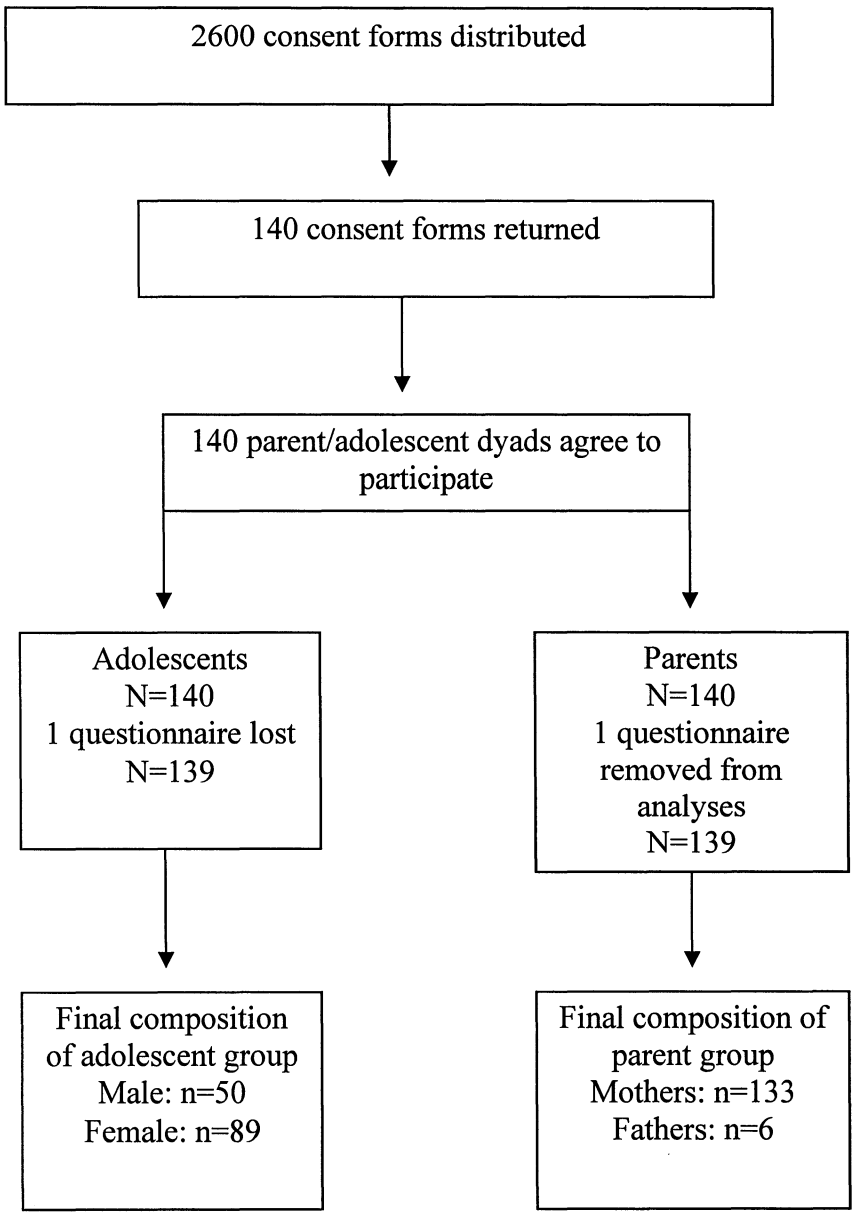

Figure 4. Flow of Study 3 participants through recruitment process.

6.4.3 Outcome Measure

The Pain Management Questionnaire (PMQ) (Appendix 16) developed for study 3 was designed to obtain general demographic information (e.g., age, grade or occupation, gender) and to assess three primary pain and pain management dimensions; (1) pain prevalence, intensity and treatment, (2) attitudes about pain and pain management, and (3) knowledge about OTC medications. The Pain Questionnaire section of the PMQ assessed four primary, non-gender specific pain types (i.e., head, stomach, ear/throat and muscle pain), as well as menstrual pain for female particpants, in terms of frequency of occurrence, intensity of pain, frequency of medicating for relief, type of medication chosen for relief, dose of medication used and duration of medication use. The Attitudes Toward Over the Counter (OTC) Medications section of the PMQ was designed to assess the extent to which participants agreed or disagreed with a series of statements about OTC medications. The Attitudes Toward Over the Counter (OTC) Medications measure is composed of six subscales intended to measure the direction of participants' attitudes as they relate to issues of (1) side effects, (2) tolerance, (3) addiction, (4) drug abuse, (5) stoicism and (6) harm. Finally, the Knowledge Questionnaire section of the PMQ was designed to assess the general knowledge of OTC medications with a series of fourteen binary questions from which a final score could be tabulated. The PMQ was adapted from the limited research conducted on attitudes toward pain medication in the preceding sections.

6.4.4 Procedure

Participants were contacted via telephone at a time that had been noted on the consent forms as most convenient for their family. A research assistant, trained in interviewing techniques, introduced herself, reminded the parent of the study they had agreed to participate in

and asked for confirmation that this was indeed a good time to proceed. No parent or adolescent refused. The Pain Management Questionnaire (PMQ) was administered over the phone to the parent and the adolescent. The order of questionnaire administration was randomized for each mother-adolescent dyad. Although the questionnaire was reasonably straight forward, instructions given to both parents and adolescents were detailed and clear. Participants were encouraged to ask questions or request clarification on any questionnaire item if they needed it. Assistance was given to those who requested help in such a way that experimenter expectations (when responding to attitude items) or correct answers (when responding to knowledge items) were not revealed.

6.4.5 Data Analyses

All data were analysed using SPSS for Windows, version 9.0. Data were analyzed using the parent-adolescent dyad as the unit of analysis.

6.5 Results

6.5.1 Prevalence of Pain Types

Five common pain types were assessed in the pain prevalence section of the Pain Management Questionnaire (see Appendix 16). These were head pain, stomach pain, ear/throat pain, muscle pain and, for female participants, menstrual pain. The analyses that follow include the four non-gender specific pain types – head, stomach, ear/throat and muscle pain. Menstrual pain will be described in a separate section.

Frequencies for each pain type for parents and adolescents are presented in Table 3. Raw data are presented in Appendix 18. The most common pain episodes reported by parents were head pain (with 35.2% reporting one to ten episodes in the previous 3 months) and muscle pain

(with 19.5% reporting one to ten episodes in the previous 3 months). Similarly, muscle pain and head pain were the most common pain complaints among adolescents. Thirty-six percent of male adolescents reported one to ten muscle pain episodes in the previous three months and 26% reported one to ten head pain episodes in the previous three months. For female adolescents, 25.9% reported one to ten head pain episodes and 19.1% reported one to ten muscle pain episodes in the previous 3 months.

Table 3

Frequency of Four Primary Pain Types Among Parents and Adolescents (N=278).

	Number of episodes in previous three months	Head Pain	Stomach Pain	Ear/Throat Pain	Muscle Pain
Mother	0	49.6%	91.0%	89.5%	65.4%
(n=133)	1-5	15.8%	7.5%	9.8%	13.5%
	6-10	19.5%	0.8%	0.8%	6.8%
	11-15	5.3%	0.8%	-	6.0%
	16-25	4.5%	-	-	0.8%
	26+	5.3%	-	-	6.8%
Father	0	66.7%	83.3%	100%	66.7%
(n=6)	1-5	16.7%	16.7%	-	-
	6-10	16.7%	-	-	-
	11-15	-	-	-	16.7%
	16-25	-	-	-	-
	26+	-	-	-	16.7%
Adolescent	0	74%	90%	86%	62%
Male	1-5	20%	10%	14%	28%
(n=50)	6-10	6%	-	-	8%
	11-15	-	-	-	-
	16-25	-	-	-	-
	26+	-	-	-	2%
Adolescent	0	61.8%	78%	88.8%	78.7%
Female	1-5	13.5%	7.9%	9.0%	14.6%
(n=89)	6-10	12.4%	2.2%	1.1%	4.5%
	11-15	7.9%	1.1%	1.1%	-
	16-25	4.5%	-	-	-
	26+	-	1.1%	-	2.2%

Frequent pain episodes were not common among parents or adolescents. For head pain, 49.6% to 74% of participants reported having no such pain episodes in the previous three months. For those reporting head pain episodes, frequency among adolescents and parents during the three months prior to the study largely fell in the 1 to 5 and 6 to 10 episode range.

For stomach pain, 78% to 91% of participants reported no occurrences in the previous three months. For those reporting stomach pain episodes, frequency among adolescents and parents during the three months prior to the study largely fell in the 1 to 5 episodes range.

Similar trends were found for ear/throat pain and muscle pain. For those participants reporting ear/throat pain episodes, frequency among participants during the three months prior to the study largely fell in the 1 to 5-episode range and for those reporting muscle pain episodes, frequency during the three months prior to the study largely fell in the 1 to 5 and 6 to10 episode range.

The percentage of participants who experienced pain episodes in great frequency (eleven to twenty-five or more episodes in the previous three months) was also quite low, particularly for stomach and ear/throat pain. Head pain and muscle pain were the pain types associated with frequencies greater than eleven times over the previous three months. This was particularly evident for mothers (15.1%) and adolescent girls (12.4%) reporting high frequencies of head pain. Slightly more than 13% of mothers and 33% of fathers reported muscle pain episodes at frequencies greater than eleven times in the previous three months, however fewer than 3% of either male or female adolescents reported high frequencies of muscle pain.

Since there were too few fathers participating to detect meaningful parental differences in the variables under investigation, mothers (n = 133) and father (n = 6) were collapsed into one group herein referred to as "parents" (n = 139). Due to the low occurrences of stomach and ear/throat pain, these pain types were excluded from further analysis.

Chi square analyses were conducted on the frequency data for head and muscle pain to determine whether gender differences were apparent between male and female adolescents.

Although there was a trend toward female adolescents reporting more head pain frequency than male adolescents, this difference only approached significance χ^2 (4, N = 139) = 9.05. There were no significant differences between male and female adolescents' reported frequency of muscle pain χ^2 (3, N = 139) = 4.87.

Since the data were categorical, the non-parametric Spearman's correlation coefficients was calculated on head and muscle pain frequency data in order to determine relationships between parents' and adolescents' reported pain frequency. There were no direct (i.e. parent head pain frequency versus adolescent head pain frequency) significant correlations between parents and adolescents for either pain type (see Table 4).

Table 4

Correlations Between Parents' and Adolescents' Pain Type Frequency (N=278).

	Parents' Head Pain (n=139)	Parents' Muscle Pain (n=139)
Adolescent Male (N=50)		
Head Pain	-.108	.184
Muscle Pain	.160	.145
Adolescent Female (N=89)		
Head Pain	.118	.042
Muscle Pain	-.236 *	.043

* $p < .05$

6.5.2 Pain Intensity

Pain intensity of the most recent pain episode was rated on a scale of 0 (no pain at all) to 10 (worst pain imaginable). Spearman's correlation matrices were obtained for pain frequency and intensity data (see Table 5). For head and muscle pain, reported frequency and intensity were highly correlated.

Table 5

Correlations Between Pain Type Frequency and Intensity for Parents and Adolescents (N=278).

	Head Pain Frequency	Muscle Pain Frequency
Parent (n=139)		
Head Pain Intensity	.847 **	-.194 *
Muscle Pain Intensity	-.251 *	.950 **
Adolescent (n=139)		
Head Pain Intensity	.958 **	-.180 *
Muscle Pain Intensity	-.218 *	.963 *

* $p < .05$
** $p < .01$

Means and standard deviations of parent and adolescent intensity ratings of head and muscle pain are presented in Table 6. Raw data are presented in Appendices 19a and 19b.

Table 6

Parents' and Adolescents' Pain Intensity Ratings for Head and Muscle Pain (N=278).

	Head Pain	Muscle Pain
Parent (n=139)	Mean = 3.60 SD = 3.89	Mean = 2.29 SD = 3.38
Adolescent Male (n=50)	Mean = 1.92 SD = 3.42	Mean = 2.84 SD = 3.91
Adolescent Female (n=89)	Mean = 3.04 SD = 4.08	Mean = 1.44 SD = 3.03

Independent samples t-tests were conducted on the pain intensity data obtained for head and muscle pain in order to determine gender differences among adolescents. There were no significant differences between male and female adolescents in reported intensity of head pain,

$t(137) = -1.65$, *ns*). There was a significant gender difference among adolescents in reported pain intensity for muscle pain $t(137) = 2.35$, $p < .05$) with males reporting higher intensities of that pain type than females.

Pearson correlation coefficients were calculated on the head and muscle pain intensity data in order to determine relationships between parents' and adolescents' reported pain intensity. There were no direct (i.e. parent head pain intensity versus adolescent head pain intensity) significant correlations between parents and adolescents for head and muscle pain (see Table 7). Adolescent females' muscle pain intensity was correlated with parents' head pain intensity ($r = -.275$, $p < .01$).

Table 7

Correlations Between Parents' and Adolescents' Pain Type Intensity (N=278).

	Parents' Head Pain (n=139)	Parents' Muscle Pain (n=139)
Adolescent Male (n=50)		
Head Pain Intensity	-.200	.145
Muscle Pain Intensity	.027	.030
Adolescent Female (n=89)		
Head Pain Intensity	.049	.115
Muscle Pain Intensity	-.275 **	.079

** $p < .01$

6.5.3 Medication Use

The frequency with which participants medicated for head and muscle pain are presented in Table 8. Raw data are presented in Appendix 20.

Table 8

Frequency of Medication Use By Parents and Adolescents for Head and Muscle Pain (N=278).

	Number of times participant medicated for pain in previous three months	Head Pain	Muscle Pain
Parent (n=139)	0	54.7%	75.5%
	1-5	16.5%	9.4%
	6-10	16.5%	7.2%
	11-15	5%	4.3%
	16-25	2.9%	.7%
	26+	4.3%	2.9%
Adolescent Male (n=50)	0	80%	62%
	1-5	16%	28%
	6-10	4%	8%
	11-15	-	-
	16-25	-	-
	26+	-	2%
Adolescent Female (n=89)	0	66.3%	78.7%
	1-5	12.4%	14.6%
	6-10	12.4%	4.5%
	11-15	5.6%	-
	16-25	3.4%	-
	26+	-	2.2

There were no significant gender differences found for the medicating frequency of head pain χ^2 (4, N = 139) = 8.04, *ns* or muscle pain χ^2 (4, N = 139) = 6.90, *ns*. There were no direct (i.e. adolescent's medicating frequency for head pain versus parents' medicating frequency for head pain) significant correlations between parents and adolescents across medicating frequencies.

Additional Spearman's correlation coefficients were obtained for pain frequency and frequency of medicating data for both adolescent and parents. For all participants, the frequency

of medicating for head and stomach pain was significantly correlated with the frequency of the pain type for which medication was used (see Table 9).

Table 9

Correlations Between Head and Muscle Pain Frequency and Medicating Frequency for Parents and Adolescents (N=278).

	Head Pain	Muscle Pain
Parent (n=139)	.919 **	.813 **
Male Adolescents (n=50)	.834 **	.781 **
Female Adolescents (n=89)	.900 **	.765 **

** $p < .01$

Finally, a hierarchical regression was performed to determine the best predictors of adolescents' head and muscle pain (See Table 10). For head pain, gender was entered into the equation as a control variable, and accounted for 5.1% of the variability in adolescents' head pain, $F(1, 137) = 7.28, p < .01$. Parents' head pain accounted for an additional 2.2% of the variability in adolescents' head pain, $F(2, 136) = 5.32, p < .01$ and the interaction, an additional 1.3%, $F(3, 135) = 4.19$, $p < .01$. Taken together, the model accounted for 8.6% of the variability in adolescents' head pain. For muscle pain, gender was entered into the equation and accounted for only 1.2% of the variability in adolescents' muscle pain, $F(1, 137) = 1.63, p = .204$. Parents' muscle pain accounted for only an additional 1.2% of the variability, $F(2, 136) = 1.67, p = .193$ and the interaction, an additional .6%, $F(3, 135) = 1.38, p = 2.52$. Taken together, the model accounted for 3% of the variability in adolescents' muscle pain.

Table 10

Hierarchical Regression Predicting Adolescents' Head and Muscle Pain (N=139).

Model	R^2	F	p	ΔR^2	ΔF	$p(\Delta F)$
Head Pain						
1. Gender	.051	7.28	.008			
2. Gender AND Parents' head pain	.073	5.32	.006	.022	3.25	.07
3. Gender AND Parents' head pain AND Interaction	.086	4.19	.007	.013	1.86	.175
Muscle Pain						
1. Gender	.012	1.63	.204	.012	1.63	.204
2. Gender AND Parents' muscle pain	.024	1.67	.193	.012	1.70	.195
3. Gender AND Parents' muscle pain AND Interaction	.030	1.38	.252	.006	.81	.370

6.5.4 Medication Choice

Medication choices for head and muscle pain are presented in Table 11 ("*n*" refers to the number of participants in each group who medicated for a particular pain type). For both pain types, ibuprofen and acetaminophen accounted for much of the medication use for both parents and adolescents.

Table 11

Medication Choices of Parents and Adolescents for the Treatment of Head and Muscle Pain (N=278).

	Medication choice	Head Pain	Muscle Pain
Parent		*(n=63)*	*(n=34)*
(n=139)	Ibuprofen	34.9%	58.8%
	Acetaminophen	49.2%	17.6%
	ASA	1.6%	-
	Methocarbonol	-	11.8%
	Ketrolac	1.6%	2.9%
	Sumatriptan	3.2%	-
	Rizatriptan	3.2%	-
	Non-pharmacological	-	2.9%
	Ibuprofen/Acetaminophen	3.2%	2.9%
	Antibiotics	-	-
	Naproxen	-	-
Adolescent		*(n=11)*	*(n=13)*
Male	Ibuprofen	18.2%	23.1%
(n=50)	Acetaminophen	63.6%	69.2%
	ASA	-	-
	Methocarbonol	-	7.7%
	Ketrolac	-	-
	Sumatriptan	-	-
	Rizatriptan	-	-
	Non-pharmacological	-	-
	Ibuprofen/Acetaminophen	18.2%	-
	Antibiotics	-	-
	Naproxen	-	-
Adolescent		*(n=32)*	*(n=12)*
Female	Ibuprofen	18.8%	25%
(n=89)	Acetaminophen	71.9%	41.7%
	ASA	-	16.7%
	Methocarbonol	-	-
	Ketrolac	-	-
	Sumatriptan	3.1%	-
	Rizatriptan	-	-
	Non-pharmacological	-	16.7%
	Ibuprofen/Acetaminophen	6.3%	-
	Antibiotics	-	-
	Naproxen	-	-

6.5.5 Menstrual Pain

Menstrual pain was treated separately from the other four major pain types. Of the 89 female adolescent-parent dyads participating, 87 were daughter-mother pairs and 2 were daughter-father pairs. The 2 daughter-father dyads were dropped from the menstrual pain analyses so that daughter-mother similarities could be retained. Frequency of menstrual pain, means, and standard deviations for menstrual pain intensity and frequency of medicating for menstrual pain are presented in Table 12.

Table 12

Frequency of Menstrual Pain, Intensity of Menstrual Pain and Frequency of Medicating For Menstrual Pain Among Female Adolescents and Mothers (N= 174).

	Frequency of menstrual pain		Intensity of menstrual pain	Frequency of medicating for menstrual pain	
Adolescents	0	60.9%	Mean = 3.13	0	62.1%
	1 – 5	37.9%	SD = 3.92	1 – 5	35.6%
	6 - 10	1.1%		6 - 10	2.3%
Mothers	0	72.4%	Mean = 2.37	0	73.6%
	1 – 5	26.4%	SD = 3.92	1 – 5	25.3%
	6 - 10	1.1%		6 - 10	1.1%

Spearman's correlations were conducted on the menstrual pain frequency and frequency of medicating of menstrual pain data in order to assess similarities between mothers and daughters. Neither of these correlations was significant (r = .004, *ns* and r = .032, *ns*, respectively). A Pearson correlation was conducted on the menstrual pain intensity data in order to assess similarities in menstrual pain intensity between mothers and daughters. This correlation was not significant (r = -.012, *ns*).

The medications chosen by adolescents and mothers to relieve menstrual pain are presented in Table 13 ("*n*" refers to the number of participants in each group who reported menstrual pain that required relief with medications). Although mothers employed a wider range of medications to relieve menstrual pain, ibuprofen and acetaminophen accounted for most of the pain management strategies employed by adolescents and mothers.

Table 13

Medication Choices of Adolescents and Mothers for Relief of Menstrual Pain (N=174).

	Medication choice	Percent of participants using medication
Adolescents	Ibuprofen	42.9%
(*n = 35*)	Acetaminophen	45.7%
	Ibuprofen/acetaminophen	11.4%
Mothers	Ibuprofen	51.7%
(*n = 29*)	Acetaminophen	27.6%
	ASA	3.4%
	Ketrolac	3.4%
	Ibuprofen/acetaminophen	6.9%
	Naproxen sodium	6.9%

Finally, a hierarchical regression was performed to determine the best predictors of female adolescents' menstrual pain (See Table 14). Mothers' menstrual pain was entered as the control variable and accounted for only .2% of the variability in adolescents' menstrual pain, $F(1, 84) = .13, p = .722$. Adolescents' head pain contributed only an additional .7%, $F(2, 83) = .375, p = .689$ and adolescents' muscle pain, 0%, $F(3, 82) = .257, p = .728$. The addition of mothers' muscle pain, $F(4, 81) = .025, p = .728$, and mothers' head pain, $F(5, 80) = .449, p = .813$, contributed only an additional 1.5% and .3%, respectively to the variability in adolescents'

menstrual pain. The model accounted for a total of 2.7% of the variability in adolescents' menstrual pain.

Table 14

Hierarchical Regression Predicting Adolescents' Menstrual pain (N=87).

Model	R^2	F	p	ΔR^2	ΔF	$p(\Delta F)$
1. Mothers' menstrual pain	.002	.13	.722			
2. Mothers' menstrual pain AND Adolescents' head pain	.009	.37	.689	.007	.62	.432
3. Mothers' menstrual pain AND Adolescents' head pain AND Adolescents muscle pain	.009	.26	.856	.000	.03	.863
4. Mothers' menstrual pain AND Adolescents' head pain AND Adolescents muscle pain AND Mothers' muscle pain	.025	.51	.728	.015	1.27	.263
5. Mothers' menstrual pain AND Adolescents' head pain AND Adolescents muscle pain AND Mothers' muscle pain AND Mothers' head pain	.027	.45	.813	.003	.221	.639

6.5.6 Attitude Measures

The Attitudes Toward Over-the-Counter Medications measure, consisting of side effects, tolerance, addiction, drug abuse, stoicism and harm subscales, were subjected to reliability analysis to determine internal reliability. The measure was developed based on that used by Forward et al. (1996) in their assessment of mothers' attitudes toward acetaminophen and medicating behaviors. The Attitudes Toward Children's Pain Medications measure has internal consistency reliability, using Cronbach's alpha, of .78 (Forward et al., 1996) and has been used elsewhere with an internal consistency reliability of .73 and (Chambers et al., 1997b) and .98

(Huth et al., 2003). In the process of developing this tool, Forward et al. (1996) tested five subscales with four items each for a total of 20 items. In subsequent reliability analysis, seven items were removed from analysis since they were more highly correlated with a subscale other than their own. This resulted in the elimination of the stoicism subscale as well as one tolerance item and two drug-abuse items (Forward et al., 1996). Another purpose to the current study was to improve the internal reliability of the attitude measure. Items were reworded to reduce ambiguity and simplified to apply to both adolescents and adults. The stoicism scale was reformulated and a harm subscale was added.

The final measure consisted of six subscales with three items each for a total of eighteen items. Responses to attitude items were assigned a numeric value on a scale of one to five (1 = strongly disagree, 2 = disagree, 3 = don't know, 4 = agree, 5 = strongly agree). The items consisted of both positively and negatively framed items. Positive items were those to which agreement (i.e., a high score) expressed a positive attitude. Negative items were those to which agreement (i.e., a high score) expressed a negative attitude. In order to ensure that a high score always meant a positive attitude, negative items were reverse-scored prior to analyses (see Appendix 17).

A reliability analysis was performed on the attitude measures to determine whether items should be removed from further analyses. Items with negative item to total correlations with their own subscale were excluded as well as items that correlated more highly with the totals of subscales other than their own. No items had these characteristics, that is, all items conceptually belonged in their subscales and were retained for further analyses.

Reliability analyses on the items of the attitude measures indicated that the side effects subscale had the highest coefficient alpha ($\alpha = 0.86$) of the six subscales. The coefficient alphas for the tolerance and addiction subscales were reasonably high at $\alpha = 0.83$ and $\alpha = 0.76$, respectively. The drug abuse subscale ($\alpha = 0.64$), stoicism ($\alpha = 0.69$) and harm subscales ($\alpha = 0.60$) were moderately correlated.

Mean scores, ranges and standard deviations for each subscale of the attitude measure are presented in Table 15. Raw data are presented in Appendices 21a, 21b and 21c. Participants rated the extent of their agreement with attitude items on each of six subscales on a scale of 1 to 5. Reverse scoring of those attitude items that were negatively framed ensured that a high score always meant a more positive attitude. The highest score a participant could receive on any subscale was 15 – indicating a strong positive attitude. For the purpose of conceptualizing the numbers for the reader, scores falling between 1 and 4.9 were considered to be indicative of negative attitudes, scores falling between 5 and 9.9 were considered to be indicative of cautious attitudes and scores falling between 10 and 15 were considered to be indicative of positive attitudes. Attitudes of adolescents and parents were largely cautious for the side effects subscale, the tolerance subscale and the harm subscale indicating moderate concern about OTC analgesics' potential negative side effects, the possibility of becoming tolerant to the effects of OTC analgesics with continued use or over use and the potential harm of OTC analgesics when over used or misused. For both adolescents and parents, attitudes were cautious to positive for the addiction subscale indicating mild to moderate concern about the potential for becoming addicted to OTC analgesics when using them for pain relief. Finally, attitudes for both

adolescents and parents were cautious to positive on the stoicism subscale, indicated that participants believed that pain was not necessarily something that made you stronger when endured without pharmacological intervention.

Table 15

Mean (SD) Attitude Subscale Scores of Parents and Adolescents (N=278).

Subscale	Parent (n=139)	Adolescent: Male (n=50)	Adolescent: Female (n=89)
Side Effects subscale	7.14 (3.73)	7.92 (3.05)	7.47 (3.02)
Tolerance subscale	9.24 (3.69)	7.82 (2.53)	8.36 (3.50)
Addiction subscale	11.98 (2.37)	8.76 (1.95)	9.57 (2.10)
Drug Abuse subscale	8.35 (2.47)	9.20 (1.67)	9.03 (2.0)
Stoicism subscale	11.86 (2.05)	9.34 (1.76)	9.73 (2.36)
Harm subscale	8.14 (1.72)	8.70 (1.40)	8.67 (1.81)

Independent samples t-tests were conducted on each of the attitude subscales in order to determine gender differences in adolescents' attitudes. The only significant gender difference found was for the addiction subscale, t (137) = -2.25, $p < .05$, indicating that female adolescents had less concern about problems with addiction when using OTC medications than adolescent males.

Pearson correlations were conducted between adolescents' and parents' scores on each of the attitude subscales in order to assess similarities in attitudes toward OTC medications. These correlations are presented in Table 16, with significant correlations flagged.

Table 16

Correlations Between Adolescents' and Parents' Attitude Subscale Scores (N=278).

	Parents (n=139)					
	Side effects	Tolerance	Addiction	Drug Abuse	Stoicism	Harm
Adolescents (n=139)						
Side Effects	.105	.131	-.026	.104	-.007	-.112
Tolerance	-.249	-.030	-.238 **	-.266 **	-.093	.168 *
Addiction	-.078	-.022	-.172 *	.010	-.016	.153
Drug Abuse	-.116	-.058	-.022	.057	-.047	-.060
Stoicism	-.027	-.057	-.210 *	-.019	-.011	.092
Harm	.102	.004	.048	.229 **	.015	-.095

* $p < .05$
** $p < .01$

With the exception of the addiction subscale, few direct correlations were found between parents and adolescents on attitude subscales. The negative correlation on the addiction subscale ($r = -.172$, $p < .05$) indicates that as parents' attitudes toward addiction became more positive (i.e., less concern about addiction), adolescents' attitudes became less positive (i.e., more concerns about addiction). Other significant negative correlations were obtained between adolescents' attitudes toward tolerance and parents' attitudes toward addiction ($r = -.238$, $p < .01$) indicating that as parents became less concerned about addiction resulting from OTC medication use, adolescents became more concerned about issues of tolerance when using OTC medications; adolescents' attitudes toward stoicism and parents' attitude toward addiction ($r = -.210$, $p < .05$) indicating that as parents became less concerned about addiction resulting from OTC medication use, adolescents became more inclined to agree that stoicism was an appropriate pain coping strategy. Positive correlations between adolescents' and parents' attitude subscale scores included adolescents' attitudes toward harm and parents' attitudes toward drug

abuse (indicating that as parents' became less concerned about harm issues in OTC medication use, adolescents were less inclined to agree that stoicism was an appropriate pain coping strategy) and adolescents' attitudes toward tolerance and parents' attitudes toward harm (indicating that as parents became less concerned about harm issues in OTC medication use, adolescents became less concerned about tolerance resulting from OTC medication use).

Finally, a hierarchical regression was performed to determine the best predictors of adolescents' attitudes toward OTC medications (see Table 17). For this purpose, six new variables were created; (1,2) scores on each of the attitude subscales were collapsed into one total attitude score each, for parents and adolescents (3,4), the maximum pain frequency reported for head and muscle pain was collapsed into one total pain score each, for parents and adolescents, and (5,6) the maximum pain medicating frequency for head and muscle pain was collapsed into one total pain medicating frequency score each, for parents and adolescents. Gender was entered into the equation as a control variable and accounted for .5% of the variability in adolescents' attitudes, $F(1, 137) = .65, p = .420$. Parents' attitudes accounted for an additional .8%, $F(2, 136) = .89, p = .414$. Adolescents' maximum medication use and maximum pain reported accounted for an additional .9% $F(3, 135) = .99, p = .401$ and .1%, $F(4, 134) = .76$, $p = .552$, respectively, and adolescents' knowledge contributed nothing to the equation at all, $F(5, 133) = .61, p = .690$. Finally, parents' maximum reported pain, maximum medication use and knowledge, together, contributed an additional 3.3%, $F(8, 130) = .95, p = .480$ to the equation. Taken together, the variables in this equation accounted for a 5.5% of the variability in adolescents' attitudes toward OTC medications.

Table 17

Hierarchical Regression Predicting Adolescents' Attitudes (N=139).

Model	R^2	F	p	ΔR^2	ΔF	$p(\Delta F)$
1. Gender	.005	.65	.420			
2. Gender AND Parents' total attitude score	.013	.89	.414	.008	1.12	.291
3. Gender AND Parents' total attitude score AND Adolescents max. medication use	.021	.99	401	.009	1.19	.278
4. Gender AND Parents' total attitude score AND Adolescents' max. medication use AND Adolescents' max. pain score	.022	.76	.552	.001	.105	.747
5. Gender AND Parents' total attitude score AND Adolescents' max. medication use AND Adolescents' max. pain score AND Adolescents' knowledge	.023	.61	.690	.000	.041	.839
6. Gender AND Parents' total attitude score AND Adolescents' max. medication use AND Adolescents' max. pain score AND Adolescents' knowledge AND Parents' max. pain score, parents' max. medication use, parents' knowledge	.055	.95	.480	.033	1.50	.220

6.5.7 Knowledge

The knowledge questionnaire consisted of twenty-five statements about OTC medication safety, use and dosing. The items were phrased in true or false format. Correct answers were assigned a score of one and incorrect answers were assigned a score of zero (see Appendix 17). One item (number 18) was specific to females only ("Is ibuprofen is effective in reducing menstrual pain?). Male participants were not required to answer this question. Therefore, the maximum total score a male participant could receive on the knowledge questionnaire was

twenty-four and the highest maximum score a female participant could receive was twenty-five. For this reason, males' scores on the Knowledge Questionnaire were rescaled (by multiplying the total score by 1.04) in order to ensure the same potential range as females' scores. Mean scores, ranges and standard deviations obtained by adolescents and parents on the Knowledge Questionnaire (rescaled for male adolescents and fathers) are presented in Table 18. Raw data are presented in Appendix 22.

Table 18

Mean Knowledge Scores For Parents and Adolescents (N=278).

	Parent *(n=139)*	Male adolescents (n=50)	Female Adolescents *(n=139)*
Mean	19.35	15.0	15.47
Standard Deviation	2.37	2.22	2.76
Range	13.0 – 25.0	11.44-20.80	9.0 – 24.0

There were no significant differences in the Knowledge Questionnaire scores obtained by male and female adolescents, $t(137) = -.01$, *ns*. Parents scored significantly higher on the Knowledge Questionnaire than adolescents, $t(138) = -14.81$, $p < .01$.

Finally, a hierarchical regression was performed to determine the best predictors of adolescents' knowledge scores (see Table 19). Gender was entered into the equation as a control variable and accounted for .7%, $F(1, 137) = 1.03$, $p = .31$, of the variability in adolescents' knowledge scores. The addition of parents' knowledge scores contributed an additional 2.2%, $F(2, 136) = 2.05$, $p = .13$, to the equation. Adolescents' maximum medication use and maximum reported pain contributed .6%, $F(3, 135) = 1.63$, $p = .19$, and .1%, $F(4, 134) = 1.23$, $p = .30$, respectively, and the addition of adolescents' attitudes contributed nothing at all to the equation

$F(5, 133) = .98, p = .43$. Finally, the addition of parents' attitudes, parents maximum reported pain and maximum medication use contributed an additional 2%, $F(8, 130) = .96, p = .48$ to the equation. Taken together, all of the variables in the model accounted for a total of 5.6% of the variability in adolescents' knowledge of OTC medications.

Table 19

Hierarchical Regression Predicting Adolescents' Knowledge of OTC Medications (N=139).

Model	R^2	F	p	ΔR^2	ΔF	p(ΔF)
1. Gender	.007	1.03	.313			
2. Gender AND Parents' knowledge score	.029	2.05	.133	.022	3.06	.313
3. Gender AND Parents' total knowledge score AND Adolescents max. medication use	.035	1.63	.186	.006	.785	.083
4. Gender AND Parents' total knowledge score AND Adolescents' max. medication use AND Adolescents' max. pain score	.036	1.23	.299	.001	.091	.377
5. Gender AND Parents' total knowledge score AND Adolescents' max. medication use AND Adolescents' max. pain score AND Adolescents' attitude score	.036	.98	.431	.000	.008	.764
6. Gender AND Parents' total attitude score AND Adolescents' max. medication use AND Adolescents' max. pain score AND Adolescents' knowledge AND Parents attitude score, parents' max. pain score, parents' max. medication use	.056	.96	.467	.020	.938	.424

6.6 Discussion

6.6.1 Pain Prevalence

Prevalence of the four major non-gender specific pain types and the frequency with which pain types were experienced were consistent with the ranges described in the pain literature for both parents and adolescents (Chambers et al., 1997a; Fichtel & Larsson, 2002; Perquin et al., 2000; Rhee, 2000; Unruh; 1996). The frequency with which female participants experienced menstrual pain was also consistent with the ranges that have been described in previous studies (Campbell & McGrath, 1997; Chambers et al., 1997a; Unruh & Campbell, 1999). In the present study, head pain and muscle pain were the most commonly reported pain types for adolescents and parents. Stomach pain and ear/throat pain went largely unexperienced by more than 78% of participants.

The pain types experienced in the present study were similar to those reported in both studies 1 and 2. In study 1, male and female adolescents reported that muscle, joint, head, stomach (female adolescents only) and menstrual pain were the most frequent pain episodes they had experienced in the month previous to the study. In study 2, parents reported that head, muscle and menstrual pain were the most common pain episodes experienced over the previous month.

6.6.2 Gender Differences in Pain Prevalence

Gender differences in pain prevalence and frequency of head, muscle and stomach pain among adolescents were consistent with those reported in the literature (Rhee, 2000; Unruh & Campbell, 1999). Although there was a trend toward female adolescents reporting more head pain than male adolescents and male adolescents reporting more muscle pain than female

adolescents, this difference was not significant. Nonetheless, differences in head pain may be attributable to the onset of menstruation in female adolescents and the altered hormone fluctuation that contributes to headache (Silberstein & Merriam, 1993). The lack of significant gender differences in muscle pain may be attributed to the similarity in cause. Although participants in the present study were not asked to provide information about the cause of their pain, information from studies 1 and 2 indicated that the majority of muscle pain experienced by adolescents could be attributed to athletics. In these studies there were no apparent gender differences in participation in sports or in reported muscle pain frequency. Finally, female adolescents were more likely to report stomach pain (22%) than either male adolescents or parents. Although stomach pain went largely unreported by all participants and this difference was not significant, the trend for female adolescents to report more abdominal pain than male adolescents was apparent.

6.6.3 Parent-Adolescent Similarities in Pain Prevalence

The wide range of frequency with which parents experienced both head and muscle pain might be expected to facilitate the modeling of pain behaviors by providing multiple episodes from which adolescents could learn to respond to and cope with pain (Craig, 2002). However, modeling of parental pain behaviors by adolescents was not supported in the data analyses; direct correlations between parents and adolescents for head and muscle pain frequency were not significant and with adolescents' gender controlled, parents' pain and gender-pain interaction accounted for only 3 to 8% of the total variance in adolescents' pain. However, female adolescents' muscle pain was negatively correlated with parents' head pain, indicating that as parental reports of muscle pain increased, female adolescents' reports of muscle pain decreased.

Although not indicative of modeling per se, this finding may indicate that for female adolescents, parents' overt expression of head pain may be informative of what types of pain are acceptable to openly express.

6.6.4 Gender Differences in OTC Medication Use

The greatest frequency of medication use by adolescents and parents was for head pain, muscle pain and menstrual pain. These data are widely supported in the literature (Burak & Damico, 2000; Campbell & McGrath; Chambers, 1997a). Although female adolescents reported a wider range of medicating frequency for head pain, this difference was not significant. The trend for females to medicate for head pain with greater frequency than boys has been reported elsewhere (Chambers et al., 1997a; Fichtel & Larsson, 2002). One of the hypotheses in the pain literature to account for gender differences in medicating frequency is that girls' knowledge of analgesics for menstrual discomfort may be generalized to analgesic use for other types of pain unrelated to menstruation (Chambers et al., 1997a; Hart & Hill, 1997). For adolescent male and females, as well as parents, medicating frequency was significantly correlated with pain frequency and intensity.

6.6.5 Parent-Adolescent Similarities in Medication Use

Finally, the evidence for modeling of medication use was unclear. Although correlations between parents' and adolescents' medicating frequency for both head and muscle pain were not significant the medication choices reported by parents and adolescents were similar; acetaminophen and ibuprofen accounted for most of the medication choices in the treatment of head, muscle and menstrual pain. Similarities in medication choice may have less to do with modeling and more to do with availability of medications in the home (Chambers et al., 1997a;

Stoelben et al., 2000) and the nature of the pain experienced (i.e. recurrent pain as opposed to chronic pain requiring prescription medications).

6.6.6 Parent-adolescent Similarities in Attitudes Toward OTC Analgesics

Research addressing maternal attitudes toward OTC analgesic use in the treatment of children's pain indicate negative attitudes, particularly concerning side effects, tolerance and addiction (Finley et al., 1996; Forward et al., 1996). However, the findings of the present study indicated that both parents' and adolescents' attitudes toward OTC analgesics fell largely in the cautious-to-positive range. The highest score a participant could get on any attitude subscale was 15, indicating a positive attitude. Mean attitude scores for all the subscales ranged from 7.14 (just below the mid-point) to 11.98. Admittedly, the lowest attitude scores obtained were for the side effects subscale, however these scores were not low enough to be considered negative. There may be several reasons for parents' cautious-positive attitudes in the present study. First, the parents employed may have possessed higher than average knowledge about the safety of OTC medications (when used appropriately) for children. Therefore, the sample of parents employed in the present study may not be representative of the general parent population. Unfortunately, there was no comparison group employed against which parents' knowledge scores could be assessed. Alternatively, these parents' attitudes may be representative of the current wisdom around children and OTC use. Where public education about the dangers of aspirin use in children has increased parents' awareness of how to manage children's pain, and the ever-growing variety of children's OTC analgesics (in the form of ibuprofen and acetaminophen) has increased parents' choices for managing their children's pain, there may very well be a general consensus among parents about the overall safety of OTC analgesics.

Although parents and adolescents possessed attitudes that were skewed to positive, this is not enough to base evidence for the modeling of attitudes. Correlations between parents' and adolescents' attitudes did not provide support either. With the exception of addiction, there were no direct (e.g. parents' versus adolescents' side effects scores) correlations between parents' and adolescents' attitudes. Indirect correlations (e.g. parents' tolerance subscale scores versus adolescents' harm score) were largely negative, indicating that as parents' attitudes became more positive, adolescents' attitudes became more cautious. Finally, parent variables (e.g. attitudes, pain frequency, medication use and knowledge accounted for only 5.5% of the total variance in adolescents' attitudes toward OTC medications.

6.6.7 Knowledge About OTC Medications

The most likely reason for the lack of congruity between parents' and adolescents' attitudes is knowledge; parents scored significantly higher on knowledge items than adolescents. Certainly, the relationship between increasing one's knowledge about pain medication and subsequent increases in positive attitudes about pain medications have been supported in the pain literature (Chambers et al., 1997b, Finley et al., 1996; Huth et al., 2003), however the most likely reason for parents' advantage over adolescents' in understanding the indications, doses and harm issues around OTC medications is experience. In the present study, parents reported more head and muscle pain frequency and intensity, more medication use and a broader range of analgesics employed for pain relief.

Studies addressing adolescents' knowledge of OTC analgesics indicate that appropriate information is lacking (Huott & Storrow, 1997; Myers et al., 1992; Sloand & Vessey, 2001; Stoelben et al., 2000). In the present study female adolescents had more knowledge about OTC

medications than males and parents had more knowledge than adolescents. One would expect parents to possess more knowledge about medications based on more frequent experiences with a variety of different pain types. The gender difference in knowledge among adolescents may be due in part to the additional pain episodes associated with menstruation. The extra experience with medication use may put female adolescents at a distinct advantage over male adolescents to acquire knowledge about OTC analgesics via multiple experiences.

6.6.8 Mothers Versus Fathers

It is worthy of mention here that although the dyads employed for the present study were mainly mother-adolescent pairs, there were six father-adolescent pairs. Although there were too few fathers participating to detect any meaningful parental gender differences, it is worth considering the extent to which fathers and mothers might differ in the way they influence their adolescents' pain experiences. The literature indicates that gender difference are apparent in how mothers and fathers react to their children's pain expression. For example, in their assessment of the roles child temperament and parental characteristics in children's pain responsiveness, Schecter, Bernstein and Beck (1991) found that fathers, more so than mothers, believe that (1) comforting a child expressing pain merely encourages crying and (2) boys can handle pain better than girls. Had more fathers participated in the present study, parental gender differences may have been apparent for attitude subscale, particularly the stoicism subscale, with fathers averaging lower mean scores than mothers (i.e., indicating that pain is something that should be tolerated). It is difficult to hypothesize about how fathers might affect adolescent's attitudes since mothers are typically the primary caregiver and children are more likely to report and express pain to their mothers than to their fathers (Zeman & Garber, 1996). Nonetheless, future

studies might endeavour to seek out father-son and father-daughter dyads in addition to mother-adolescent dyads in order to assess gender differences in parental influences on adolescents' pain, pain attitudes and knowledge.

6.7 Summary

Parent-adolescent dyads were recruited for this study in order to directly assess similarities in pain type, frequency and intensity, medication use, attitudes toward OTC analgesics and knowledge of OTC analgesics so that conclusions about the modeling of these variables, particularly attitudes and knowledge, could be made. The data in the present study did not support these hypotheses, however this should not be taken to mean that there is no influence of parents on adolescents. Adolescents in both studies 1 and 2 clearly indicated that their parents were influential sources in their pain management choices and both parents and adolescents in study 2 indicated that parents were considered to be highly influential in the expression of pain, management of pain and acquisition of information about pain management. Although the findings of the present study did not directly confirm the qualitative findings, reported medication choices of adolescents and parents indicated that pain management strategies and subsequent choices are likely made in the home.

CHAPTER 7

General Discussion

7.1 Understanding the Adolescent Recurrent Pain Experience

7.1.1 A Social Model of Adolescent Pain

In order to fully understand the recurrent pain in the adolescent one must take into consideration the rich matrix within which pain is experienced. Pain is more than just a subjective response to tissue trauma. It entails various intra- and interpersonal determinants that interact to shape the individuals' perception of pain, response to pain and action taken to alleviate pain.

Taken together, the studies presented provide the basis from which we can conceive of a model that represents the complexities of the adolescent recurrent pain experience (See Figure 5). The following sections will address each step in the model separately.

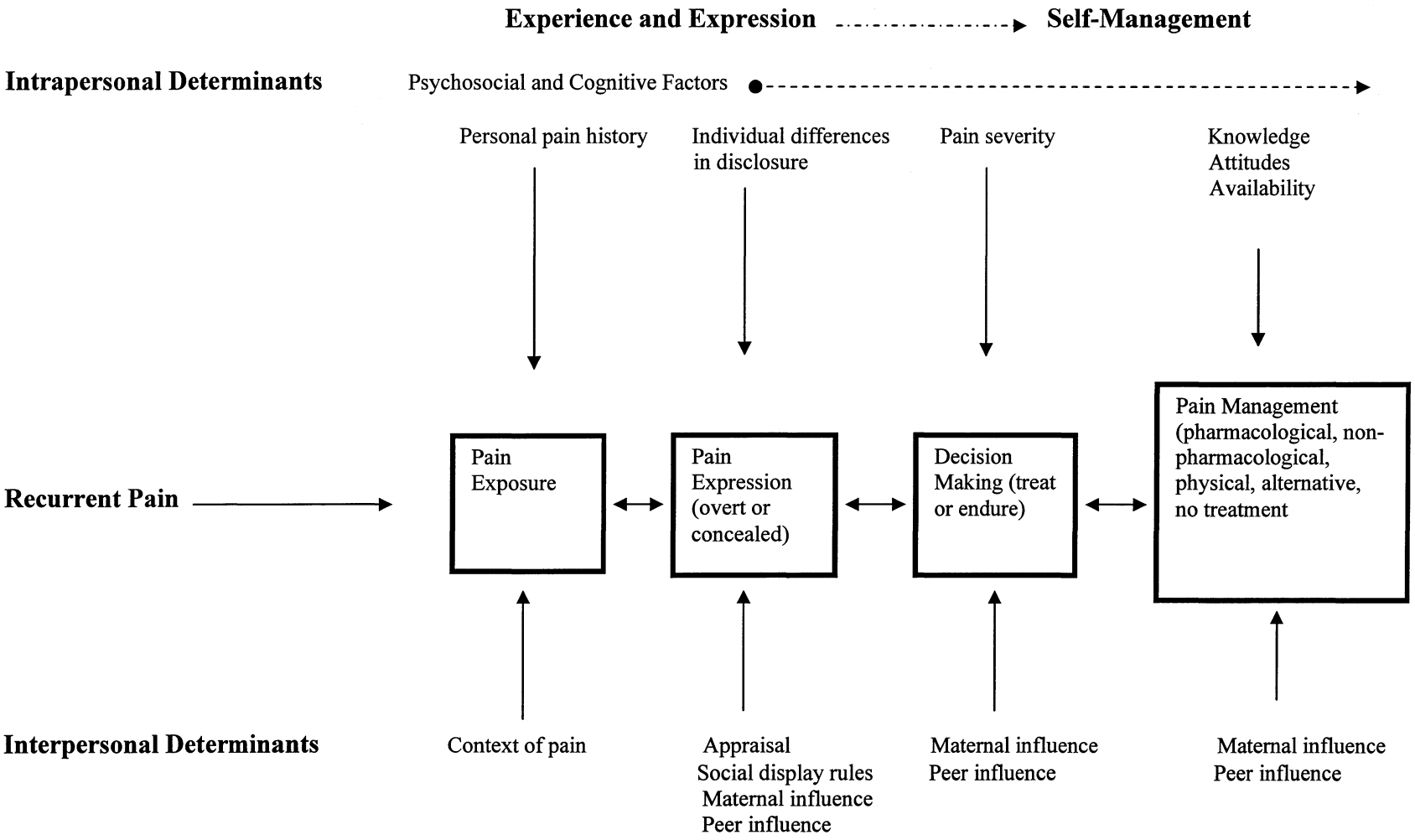

Figure 5. *A psychosocial model of adolescent recurrent pain (inspired by Craig, 2002).*

7.1.2 Cognitive and Psychosocial Factors in Adolescent Pain

Adolescents enter the model having reached a point in their psychosocial development where independence is desirable and a point in their cognitive development that is close to that of an adult. Part of the process of acquiring independence for adolescents is identity formation which involves the development of personal beliefs, values and convictions that become part of how the adolescent characterizes him/herself (Harter, 1998) and this is achieved by spending less time with family and more time with peers (Larson & Richards, 1991). As children begin to acquire a sense of independence from their primary caregivers, peer influences begin to play an important role in the development of attitudes and behaviors (Berndt, 1996; McGrath & Craig, 1989).

Where issues about pain and pain management are concerned, family influence is a powerful component of the adolescents' acquisition of attitudes and behaviors. Through the course of growing up in the context of the family environment, children are exposed to countless pain experiences – their own and others'. Repeated exposure to pain, pain expression and pain coping strategies provide the child with information from which to model their own pain expression and strategies for relief (McGrath & Craig, 1989). By the time the child approaches adolescence and begins to demonstrate independence in choices related to their own health, they have already acquired an arsenal of information from which to draw attitudes, beliefs and behaviors concerning pain.

Adolescence however, is a period of transition from childhood to adulthood that spans twelve years. Therefore the psychosocial and cognitive development of the adolescent will undergo marked changes over the course of early-, middle- and late-adolescence.

7.1.3 The Noxious Event

When the adolescent experiences a recurrent or acute pain episode, his or her personal experience with previously similar pain episodes, as well as their experience with others' pain episodes will largely affect pain appraisal. However, the context of the pain episode will likely influence decisions about pain expression. For example, adolescents in study 1 reported that there were clear distinctions between legitimate pain and illegitimate pain. For these adolescents, particularly males, pain episode appraisal and the decision to express or dampen pain responses was often a function of how the pain was incurred, how serious the tissue trauma was and who was present at the time of injury.

7.1.4 Pain Expression

Once appraisal of the pain context is completed the adolescent will either express pain overtly or conceal pain expression. This will depend largely on individual differences in the desire to disclose information about pain being experienced, however additional influential factors may include appraisal of the personal costs and/or benefits of pain expression and the social display rules of pain expression. For example, adolescents in study 1 indicated that they often carefully assessed the merits of overt pain expression to determine the extent to which such expression would yield loss (e.g., inability to participate in social or extracurricular activities) or lack of expression would cause further harm (e.g., sustaining further injury or fear of impending illness). Where the loss of enjoyable activities is perceived, pain responses will likely be dampened, however this will be mitigated by perceptions of symptom severity and fear of aggravating a serious condition.

Gender differences in social display rules will also influence the extent to which pain is expressed. For example, adolescents in study 1 indicated that it was more acceptable among peer groups for girls to openly discuss and express pain of various types but unacceptable for boys to discuss or express pain associated with mishaps. How peers view the overt expression of pain will also likely influence the adolescents' pain behavior. For example, participants in study 1 held largely negative attitudes toward peers who complained openly about pain that was perceived as not severe. Where the adolescent perceives negative peer response, pain expression may be dampened.

Maternal influences will also play a large role in how adolescents express pain. Where maternal attitudes toward coping strategies and stoicism are positive and encouraged, adolescents will likely dampen their pain expression. For example, mothers in study 2 were more likely to employ coping strategies such as distraction or ignoring pain when they were concerned about how their adolescent children might perceive their overt pain expression, this was particularly true for those mothers suffering form chronic pain conditions like arthritis. Mothers who expressed low tolerance for others who overtly expressed pain were also likely to minimize their own pain expression. These attitudes and behaviors toward pain expression were transmitted to the adolescent who also reported similar coping mechanisms.

7.1.5 Personal Decision Making

The decision to treat a pain episode will largely be a function of perceived pain severity. The adolescent will assess symptom severity and the extent to which they can endure further pain when deciding to treat pain. For example, adolescents in study 1 indicated that they decided to take action against their pain when it began to negatively affect physical performance or

concentration. In study 3, adolescents were more likely to medicate for pain where frequency and intensity were high.

Maternal influences will also be apparent during the decision making phase. Often times, parents (particularly mothers) will be consulted in order to determine whether or not a pain episode ought to be treated. This was apparent in the data from both studies 1 and 2 where adolescents indicated that when they had pain they often asked their mothers what they should do about it. This was particularly true where the pain was unfamiliar to the adolescent and there was a fear of further harm. Some adolescents however, will be considerably more independent in their decision to treat their pain episodes. Where the pain experienced is ongoing or familiar, the adolescent will make the decision to treat based on what they have done in the past. For example, adolescents in studies 1 and 2 often reported that they were completely independent in their pain management decisions because their parents knew they had frequent recurrent pain that required treatment. Mothers of adolescents who independently made decisions about their pain management indicated that they were aware of their adolescents' recurrent pain experiences and pain management decisions, and were confident that their adolescent had sufficient knowledge to make the appropriate decisions.

The extent to which mothers encourage stoicism or positive coping strategies will influence adolescents' decisions to treat or endure pain episodes. Where adolescents are encouraged to get on with their usual activities, as was cited by some mothers in Study 3, the decision to treat or endure pain may be a very easy one.

7.1.6 Pain Management

Finally, the pain management choice opted for will depend on the adolescent's knowledge of pain management options, independence in accessing different methods of pain relief, the availability of pain management options and attitudes toward various pain management strategies. These variables will in turn be subject to peer and maternal influences.

The adolescent's knowledge of pain management options, particularly OTC analgesics, will likely be poor. Study 3 findings indicated that adolescents' knowledge of OTC medications was significantly less than their parents. This was supported by the findings in study 1. Although adolescents in study 1 reported independent pain management with OTC analgesics, knowledge of dosing was often poor and based on vague concepts of perceived effectiveness. The adolescent's knowledge of OTC analgesics will likely increase with increases in pain episode frequency and resulting experiences with pain management. For example, adolescents in study 2 who reported experience with frequently recurring pain appeared to possess more knowledge about the type of medication they should use for pain relief and the appropriate dose for managing their pain. This knowledge was further facilitated via maternal influence and is indicative of the learning process of independent pain management for the adolescent.

The ease of access to pain management options will also facilitate the choices adolescents make. In studies 1 and 2, adolescents reported using OTC analgesics where medications were readily available in the home. Peer influences were apparent for adolescent girls who had the additional resource of peers from whom they could obtain OTC analgesics for the treatment of menstrual pain. Adolescents in both studies 1 and 2 reported that when non-pharmacological strategies were employed (i.e., massage or physiotherapy) their mothers made those strategies

available. Adolescents in studies 1 and 2 often reported that they employed whatever pain management strategy their parents used (either pharmacological or non-pharmacological) and evidence for shared pain management strategies in study 2 provide evidence for maternal influences in pain management via modeling. In study 3, both adolescents and parents reported using the same OTC analgesics (i.e., acetaminophen and ibuprofen) for the management head and muscle pain.

Finally, attitudes toward pain management will influence how adolescents manage their pain. The pain management strategies chosen will likely be a function of perceived effectiveness and safety. For example, the adolescents in studies 1 and 2 reported using a wide variety of pain management strategies and reported a range of attitudes about effectiveness and safety. Where attitudes toward OTC medications were cautious or negative, non-pharmacological strategies were employed first. Maternal influences will also have a profound impact on the adolescent's attitudes about pain management. For example, adolescents in study 2 who employed the same pain management strategies as their mothers typically held positive attitudes about those strategies.

Clearly, there is a complex interplay of personal, psychosocial and familial factors that influence the adolescents' recurrent pain experience. Perhaps the most important aspect of this model is its' dynamic nature. It is important to appreciate that the young adolescent is just beginning their shift toward independence in the management of their own pain. Therefore, knowledge of pain and pain management options, as well as attitudes about pain and pain management are still developing. Through continued personal experience with pain and the collective influences of peers and parents (primarily mothers) on pain expression, decision-

making, knowledge and attitudes, the adolescent will gradually approach an adult-like understanding of pain and pain management.

7.1.7 Additional Variables of Potential Influence

Consideration has also been given to additional variables that are worthy of future investigation and could perhaps augment the proposed model. Social learning theory focuses on the unidirectional influence of parents on their children through modeling and reinforcement. Interaction theory, on the other hand, proposes the reciprocal nature of the parent-child relationship wherein interactions are characterized by mutual reinforcement and punishment. The dyadic relationship is composed of mutually dependent parts and is essentially circular, with responses, actions, reactions and feedback facilitating responses and potentially modifying responses on both the parents' and the child's part (Maccoby & Martin, 1983). According to Bell and Harper (1977), each individual in a dyadic parent-child relationship establishes a permissible range of behavioral intensity, frequency and appropriateness. When these ranges are exceeded in either direction, action is taken to either decrease behaviors that have exceeded the upper range or increase the behaviors that have exceeded the lower range. In the context of this reciprocity, parents may not be merely modeling attitudes and behaviors for their children to acquire, but also modifying their attitudes and behaviors in response to their children's reactions, and visa versa. These mutual exchanges may account for the development of attitudes and behaviors, as opposed to the unidirectional process supported by social learning theory.

Parenting style may also have an effect on how children acquire attitudes and behaviors about pain and pain management. The developmental literature (see Maccoby & Martin, 1983) for review) describes four types of parenting styles; (1) authoritarian-autocratic, wherein parents

exert all the power and place strict limits on children's expression of their needs, (2) indulgent-permissive, wherein parents are tolerant and accepting of children's impulses and allow children to regulate their own impulses without imposing rules, (3) authoritative-reciprocal, characterized by open communication and the expectation that both children and parents be responsive to each others' reasonable demands and (4) indifferent-uninvolved, wherein the parent ensures that little time or effort is expended in interacting with their child. Although these parenting styles have been researched within the contexts of children's personality, self-esteem, self-concept and moral development, they can be applied to the acquisition of attitudes and behaviors that contribute to the aforementioned developmental areas.

Finally, cultural differences should not be ignored when considering additional variables that may influence the development of attitudes and behaviors about pain and pain management. Culture is an essential component of social context, and ones' culture can directly influence subjective pain experiences, behavioral responses to pain and coping strategies adopted for pain management. Although it might be expected that parents' attitudes and behaviors would reflect culturally based attitudes toward pain and pain management, the argument is theoretical; little research has addressed cultural variation in children's pain responses or cultural variation in parental influences on children's pain attitudes and behaviors (see Bernstein & Pachter, 1993 for review).

Abu-Saad (1984a; 1984b) employed a qualitative design to investigate how Latin-American, Arab-American and Chinese-American children describe pain experiences. Semi-structured interviews revealed that there were minimal cross-cultural differences and that all three cultural groups described pain in terms of sensory components. The children participating

however, were all first generation Americans. In all likelihood, acculturation to American health and illness beliefs was the reason for lack of cultural variation. For this reason, immigrant parents might be more informative of how their cultural patterns of pain attitudes and behaviors influence children's pain concepts. Little research has been conducted in this area, however Fritz, Schechter and Bernstein (1991) offer some insight on how cultural variation in pain behaviors may emerge from parental responses to children's pain. Fritz et al. (1991) interviewed fourteen recently immigrated Vietnamese refugees, who were parents, in the United States about beliefs, discipline techniques and expectations regarding their children's pain. The interviews revealed that these parents were unfamiliar with Western medicine, relying largely on balms and coin rubbing, and believed that the causes of pain were illness, evil spirits or an imbalance in life forces. In terms of pain expression, parents accepted crying and overt displays of pain in very young children (less than eight years old), but encouraged stoicism (particularly through lack of physical comfort) in children older than eight years. Clearly cultural beliefs will continue to influence how parents respond to the children's pain when families relocate to a foreign culture, but how culturally driven responses to pain are mediated by the acculturation of first generation children is difficult to determine. Research conducted among non-Anglo populations have reported problems with using, or attempting to adapt, Western measures of pain to non-Western cultures. The development of culturally appropriate assessment tools that are both reliable and valid continues to be a challenge (Bernstein & Pachter, 1993). Nonetheless, cultural variation in attitudes toward pain, pain behaviors and pain management is an important component in the fuller understanding of the child's pain experience.

CHAPTER 8

Conclusions

8.1 Contribution of Current Research.

The studies presented provide a descriptive picture of the recurrent pain experience in adolescents. To date, no known research has addressed the rich social context within which adolescents experience recurrent pain. The most important contribution of the present research is the formulation of a dynamic psychosocial model within which the complex nature of the adolescent recurrent pain experience can be better understood. Research studies addressing familial and social contexts of chronic pain in very young children have provided information about how children learn about pain and pain responses, but no known research has yet addressed how those salient childhood experiences influence the adolescent who is approaching complete independence in making decisions regarding their health. The data obtained from these studies further support the salience of the familial and social context on the child's pain experience. Finally, the present research augments the existing pain literature where information on children suffering mild and moderate pain on a seldom, infrequent or occasional bases has generally been lacking.

8.2 Limitations

Low response rates resulting in small sample sizes in all three studies were considered a limitation of the present project. Qualitative methodologies necessarily require the participant to commit significant time and energy to participate in focus groups sessions and in-person interviews. The samples for both studies 1 and 2 may likely be disproportionately representative of individuals for whom the subject matter was of particular interest or individuals who

possessed very salient attitudes about pain and pain management. Similar conclusions might be drawn about the final sample obtained for study 3. Of 2, 600 consent forms distributed, only 139 parent-adolescent dyads responded. The final sample may have represented (1) individuals for whom the topic was of special interest, (2) individuals who were particularly aware of their recurrent pain and pain management strategies or (3) individuals for whom the parent-adolescent relationship was especially cohesive. These characteristics may not be representative of the general population and such a process of self-selection makes the generalization of conclusions difficult to make beyond the samples employed.

The age of the adolescents employed may also have been a limiting factor on the results obtained from all three studies. Adolescence spans the ages of ten to twenty two years and can be categorized as early adolescence (10-14 years), middle adolescence (15-17 years) and late adolescence (18 – 22 years) (Seifert & Hoffnung, 1997). Each phase of adolescence is characterized by specific developmental trends that are peculiar to a particular age. The age range of the adolescents employed in the present studies was twelve to sixteen years, a range just bridging the upper range of early adolescence and the lower range of middle adolescence.

In the context of adolescents' developing autonomy, this age range is characterized by the early phases of the process of individuation, whereby young people begin to develop a self-identity (Josselson, 1980). During the differentiation and practice/experimentation phases, young adolescents begin to challenge parental wisdom and authority, dismiss caution and rely more heavily on peers for support and approval. Although peers were highly influential in the expression of pain, challenges to parental authority were not apparent among the adolescents in studies 1 and 2, who often sought out and heeded their mothers' advice for pain management.

This finding could be indicative of two trends; (1) the adolescents in studies 1 and 2 may still have been in the early developmental phases of individuation where challenging parental authority was not a primary goal or (2) the participants employed shared particularly cohesive relationships with their parents. The adolescents in study 3 however, showed few similarities to parents with respect to attitudes about pain management. Perhaps this finding is indicative of the challenges to parental wisdom typically demonstrated in early and middle adolescence. Given that study 3 was correlational, it is impossible to draw conclusions about causality. Moreover, the developmental literature indicates that although conflicts arise during early and middle adolescence, these conflicts are typically over responsibilities and privileges, not fundamental values or social issues (Holmbeck, 1996). For adolescents in the process of achieving independence in their own health care, pain and pain management issues might be essential components that warrant deferral to parental wisdom and experience.

Nevertheless, the age ranges employed for the present studies did not represent the full range of adolescence and blurred the developmental phases of early and middle adolescence. Future studies in this area should attempt to investigate the full range of adolescence and recruit participants within the three distinctive phases in order to assess developmental differences in attitudes and social influences.

Finally, the mode of data collection in all three studies might also be considered a limitation. Whether the conversational tactics employed in studies 1 and 2 or the self-report questionnaires employed in study 3, participant reports depended largely on retrospective memory of pain events and pain management experiences. Where such self-reflection is

desirable in qualitative research, in order to capture an individuals' current social reality, it is not always desirable in quantitative designs where the goal is generalizability of findings.

8.3 Future Directions

The studies presented focused on the occurrence of recurrent pain episodes and the social influences affecting attitudes toward pain and pain management choices among adolescents. Although an understanding of the psychosocial dimensions of the adolescent's pain experience contributes to the broader understanding of recurrent pain in the pediatric population, the model may also be applied to other pediatric pain phenomenon where a better understanding of these social factors may contribute to clinical care and outcome. To date little research has assessed the psychosocial influences contributing to the development of adolescents' disability (e.g., school absence, relief from responsibility, reduced activity) due to chronic pain. Chronic pain, repeated or continuous episodes of pain either experienced as a component of a well-characterized medical disorder or by otherwise healthy children in the absence of a well-defined organic etiology (American Pain Society, 2001), is often debilitating for children and adolescents.

How young adolescents choose to resolve or cope with chronic pain is a function of many factors, but perhaps most influential is the family (Craig, 1983, 1986). Two psychological mechanisms have been explored that appear to account for much of the impact of the family on child pain behavior. These are modelling and reinforcement.

Modeling of pain behaviors is widely supported in the literature and has been reviewed in preceding chapters (Chambers et al., 2002; Goodman & McGrath, 2003; Osborne et al., 1989; Thastum et al., 1997). Walker and colleagues have explored reinforcement of pain and disability and have reported that girls perceive more parental encouragement of illness and pain behaviors

than boys, that mothers encourage illness and pain behaviors more than fathers (Walker & Zeman, 1990) and that pediatric patients suffering from recurrent abdominal pain report receiving more encouragement for pain behaviors than pediatric patients with psychiatric disorders or healthy children (Walker et al., 1993).

Ineffective coping strategies are an important mechanism by which modeling and reinforcement are realized. Pain catastrophizing is an emotion-focused strategy that involves the rumination of pain experience and exaggeration of pain appraisal and response (Reid, Gilbert & McGrath, 1998) that has been consistently related to pain and pain-related disability (Sullivan, Tripp & Santor, 2000). Although the age at which catastrophizing becomes influential is not clear, it has been reported to be associated with emotional distress and pain intensity in mid to late adolescents more than younger children (Reid et al., 1998). Maternal influences appear to be an important factor in the development of catastrophizing among adolescents with chronic pain (Dunn-Geier, McGrath, Rourke, Latter & D'Astous, 1986).

In summary, the role of modelling and reinforcement of pain in children and young adolescents by the family has been demonstrated in the present studies and widely supported in the pain literature. However, older adolescents (i.e., 15 to 19 years olds) have not been widely studied. It is at this age that adolescents make independent decisions about participation in school, leisure activities and work and thus begin to directly mediate their own disability. The role of peer influence in modelling and reinforcement of pain in adolescents has largely been ignored. Finally, how social modelling and reinforcement influence coping strategies for adolescents has not been examined in the pain literature.

Additional research is needed to investigate the social influences involved in older adolescents' chronic pain behaviors and apply a psychosocial model to the adolescents' chronic pain experience. What the literature lacks to date is an understanding of how these family and other, especially peer, influences function in the development of disability for older adolescents with chronic pain. As has been demonstrated in the present studies and supported by the existing pain literature, adolescence is the time when young people begin to take responsibility for assessing and managing their pain. Little is known about how those in mid to late adolescence with chronic pain choose to cope with pain episodes as a function of parental and peer influences. Potential studies might include an examination of how younger and older adolescents model the pain behaviors of parental and peer models in an experimental pain situation, how adolescents perceive pain behaviors of hypothetical peers using a series of vignettes and the role of peer models versus family models in early and late adolescents in coping with pain in the natural environment.

Investigating the social factors involved in the acquisition of pain behaviors and disability among adolescents would augment the existing pain literature with a further understanding of how older adolescents model pain behaviors, how pain behaviors are reinforced, how coping strategies are employed and disability experienced.

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Appendix 1
Sample questions from focus group discussions.

- What are some common types of pain that boys (girls) have?
- How often do you experience these types of pain?
- How disabling is your pain?
- Prompt: Do you ever miss school, sports or social events?
- What do you do when you have pain?
- Prompt: Do you tell your parents? Do you tell your teacher? Do you tell your coach?
- Do you take OTC medication for pain?
- Where do you get medications?
- Prompt: Do you have them in your home? Do you buy your own? Do you ask your parents?
- Some people use pain relief methods that are not medications, like massage or herbs.
- Have you ever tried treating your pain with something other than medication?
- How do you talk about pain to your parents or friends?

Appendix 2
Ethics Approval Studies 1 and 2; Dalhousie University

Dalhousie University

OFFICE OF HUMAN RESEARCH ETHICS AND INTEGRITY
Office of Research Services
337 Arts and Administration Building
Halifax, Nova Scotia
Canada B3H 4H6
Tel: (902) 494-6513
Fax: (902) 494-1595

Health Sciences Human Research Ethics Board
Letter of Approval

Date: October 5,2000.

To: Patrick J. McGrath , Department of Psychology

The Health Sciences Research Ethics Board has examined the following application for research involving human subjects:

Project # 2000-123

Title: Pain Management Strategies Used By Young Adolescents.

Submitted by: Patrick J. McGrath

and found the proposed research involving human subjects to be in accordance with Dalhousie Guidelines and the Tricouncil Policy Statement on *Ethical Conduct in Research Using Human Subjects.* This approval will be in effect for 12 months from the date indicated below.

Dalhousie Guidelines require that, on the anniversary of the effective date you must submit an annual report. Also, should there be any significant changes to either the research methodology, or the consent form used during the approval period, these changes must be submitted for ethics review. You must also notify the Office of Human Research Ethics and Integrity when the project is completed or terminated.

This letter is the official record of ethics approval by the Dalhousie Health Sciences Research Ethics Board. You may use this letter to notify funding agencies that your project has undergone a thorough review and has been granted ethics approval.

Effective Date: October 2,2000. signed: _____

John Hubert (Co-chair HSREB)
or Carl Abbott (Co-chair HSREB)

Copy sent to: ☑ Graduate Studies ☑ Research Services

Project funding (if any) Agency - Medical Research Council of Canada: Approximately $51,000 per annum (3 year duration) Awarded- June 30,2000.

Appendix 3
Consent form; Study 1

Consent Form

Pain management strategies used by young adolescents: Qualitative and quantitative studies

Study 1: Discussions on Pain Management; Adolescents

Thank you for your interest in this research study. The Pain Research Lab at Dalhousie University is interested in understanding the pain management strategies that adolescents use in order to gain relief from various types of pain. The purpose of this study is to determine what issues or concerns are important for adolescents when it comes to pain and pain management. To accomplish this we would like to hold informal focus group discussions where young people can discuss with a researcher and each other, various aspects of pain, pain management strategies and effectiveness. During the focus group session, adolescents will be asked to fill out a brief questionnaire concerning demographic variables such as age, gender, grade, and health questions. Participants may omit any questions they do not wish to answer. The groups will be composed of 8 to 10 same-gender adolescents, will take place at a conference room in the West End Mall, and will last approximately 90 minutes. The focus groups sessions will be audio-taped.

As with all of our studies, participation is strictly voluntary and you may withdraw at any time. We will offer you a $5.00 Block Buster video voucher for participation in this study to compensate you for your time.

All information gathered in this study is strictly confidential, and your name will not appear on any of the forms. In terms of the risks associated with this research, participants should be aware of two issues. First, although the information adolescents provide to the researcher will be held in confidence, in extreme circumstances where the adolescent is believed to be engaging in behavior that is a serious risk to their well-being, the researcher will be obligated to break confidentiality and inform parents in order to ensure the safety of the adolescent. Second, the subject matter to be discussed in the focus groups may raise sensitive issues for some adolescents. Every effort will be made to make these discussions as relaxed and informal as possible. There are no specific benefits to taking part in this study, but the information gathered will help us to better understand pain management strategies employed by adolescents. If you are interested in a copy of the results of this study, please inform the research assistant who will ensure that a copy is sent to you once available.

Individuals with specific may contact Dr. Patrick J. McGrath or Jill Hatchette at 494-1938 or the Psychology Ethics Committee at 494-1580.

Please sign below if you agree to participate in this study.

_____	_____
Name of parent (please print)	Name of adolescent (please print)
_____	_____
Signature of parent	Signature of adolescent

Date:_____

How can we reach you? Please leave your telephone number and the best time of day during which we can contact you.

Telephone number _____

Best time to contact you _____

Appendix 4
Pain Incident Questionnaire

Age: _____

Grade: _____

Gender: male ☐ female ☐

(1.) **How many pain episodes have you had in the last month?** _____

(2.) **What type of pain was your most recent episode?** _____

(3.) **How long did your most recent pain episode last (in days or hours)?** _____

(4.) **On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the pain experienced in your most recent pain episode.** _____

(5.) **How did you treat your most recent pain episode?** _____

(6.) **Do you suffer from a chronic or recurrent condition that causes pain?** Yes ☐ No ☐

If yes, continue with Questions 7 – 11.

(7.) **Where is your chronic or recurrent pain?** _____

(8.) **What causes your chronic or recurrent pain?** _____

(9.) **How often do you experience chronic or recurrent pain? (number of times per month)** _____

(10.) **Do you take prescription medications for chronic or recurrent pain?** Yes ☐ No ☐

(11.) **If yes, what type?** _____ **If yes, what dose?** _____

For female participants only:

(12.) **Do you experience menstrual pain?** Yes ☐ No ☐

(13.) **How long does your menstrual pain usually last?** (in days or hours) _____

(14.) **On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the menstrual pain experienced during your most recent period.** _____

(15.) **What did you use to relieve your most recent menstrual pain episode?**

_____

Appendix 5
Pain Incident Questionnaire: Codebook

Age: _____

Grade: _____

Gender: **male = 1 female = 2**

(1.) How many pain episodes have you had in the last month? _____

(2.) What type of pain was your most recent episode?

1 = chest
2 = muscle
3 = joint
4 = sprain
5 = orthodontal
6 = head
7 = bone break
8 = back
9 = menstrual
10 = migraine
11 = stomach
12 = none
13 = acute episode

(3.) How long did your most recent pain episode last (in days or hours)?

1 = 0 – 6 hours
2 = 7 – 12 hours
3 = 13 – 18 hours
4 = 19 – 24 hours
5 = 1 day
6 = 2 – 4 days
7 = 4 + days

(4.) On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the pain experienced in your most recent pain episode. _____

(5.) How did you treat your most recent pain episode?

1 = no treatment

2 = relaxation/ rest
3 = ice
4 = tape/wrap
5 = work out/exercise
6 = visit a physician
7 = ibuprofen (e.g. Motrin®, Midol®, Advil®)
8 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)
9 = acetaminophen and ibuprofen
10 = peroxide
11 = cast
12 = celecoxib (i.e. Celebrex®)
13 = naproxen (i.e. Anaprox®)
14 = acetaminophen and rest (e.g. Tylenol®, Excedrin®, Pamprin®)
15 = ibuprofen and rest (e.g. Motrin®, Midol®, Advil®)

(6.) Do you suffer from a chronic or recurrent condition that causes pain? **Yes = 1 No = 2**

If yes, continue with Questions 7 – 11.

(7.) Where is your chronic or recurrent pain?

1 = back
2 = knees
3 = back and knees
4 = menstrual
5 = chest
6 = head
7 = stomach
8 = heels
9 = ankles

(8.) What causes your chronic or recurrent pain?

1 = sports
2 = menstruation
3 = migraine
4 = asthma

(9.) How often do you experience chronic or recurrent pain? (number of times per month)
1 = 1- 10
2 = 11 – 20
3 = 21 – 30
4 = 31 – 40

5 = 41 – 50

(10.) Do you take prescription medications for chronic or recurrent pain? **Yes = 1 No = 2**

(11.) If yes, what type? _____ If yes, what dose? Omitted from analyses

1 = Naproxen (e.g. Anaprox®)
2 = anti-inflammatory
3 = steroid nasal spray
4 = celexocib (e.g. Celebrex®)
5 = indomethacin (e.g. Indocin®)
6 = ketrolac (e.g. Toradol®)
7 = novoprofen

For female participants only:

(12.) Do you experience menstrual pain? **Yes = 1 No = 2**

(13.) How long does your menstrual pain usually last? (in days or hours)

1 = 0 – 6 hours
2 = 7 – 12 hours
3 = 13 – 18 hours
4 = 19 – 24 hours
5 = 1 day
6 = 2 – 4 days
7 = 4 + days
8 = variable

(14.) On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the menstrual pain experienced during your most recent period.

(15.) What did you use to relieve your most recent menstrual pain episode?

1 = ibuprofen (e.g. Motrin®, Midol®, Advil®)
2 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)
3 = naproxen (i.e. Anaprox®)
4 = acetaminophen and ibuprofen
5 = work out/exercise
6 = no treatment
7 = heat

Appendix 6
Parent Semi-structured Interview Schedule

Tell me about the types of pain you have.
Prompt: Do you get headaches? Back aches? Stomach aches?

How often do you get (type of pain)?

What usually brings on your (type of pain)?

How disabling can your pain be?
Prompt: Do you miss work? Social events?

What do you do for your (type of pain)?

Does (pain management choice) work?

Do you always treat your pain and/or discomfort with an OTC pain medication?

What types of pain does your son/daughter most frequently experience?

How does your son/daughter manage their pain?
Probe: Who monitors pain management ion the house? Do your children self-medicate? How do they know what to take and how much to take?

Do your children tell you when they in pain and or uncomfortable?
Probe: Do they discuss their pain/discomfort with you? Has the family had discussions about what to do for pain?

Are some pains more important to treat than others?

What do you encourage your children to do for your pain?

Do you think your child is capable of managing his or her own pain?

Have you personally tried alternative forms of pain relief?
Probe: Herbal remedies? Exercise? Relaxation strategies?)

Have you recommended that your children try alternative forms of pain relief?
Probe: What types of methods? How effective were those methods?

What OTC medications are currently in your home?

Appendix 7
Adolescent Semi-structured Interview Schedule

Tell me about the types of pain you have.
Prompt: Do you get headaches? Back aches? Stomach aches?

How often do you get (type pf pain)?

What usually brings on your (type of pain)?

How disabling can your pain be?
Prompt: Do you miss school? Extracurricular activities? Social events?

What do you do for your (type of pain)?

Does (pain management choice) work?

Do you always treat your pain and/or discomfort with an OTC pain medication.
Probe: Who administers OTC medications when you are in pain? Do you self-administer OTC medication for pain? Do you first consult with an adult.

How do you know which OTC medication to take for pain?
Probe: Do you follow the instructions on the package with respect to dosing?

Do your parents know when you are in pain and or uncomfortable?
Probe: Do you discuss your pain/discomfort with your parents? Has the family had discussions about what to do for pain?

Are some pains more important to treat than others?

What do your parents encourage you to do for your pain?

Have you tried alternative forms of pain relief?
Probe: Herbal remedies? Exercise? Relaxation strategies?)

What common types of pain do you see in other family members?

What do your parents do for their pain?
Probe: Take medication? Stay home from work?

What OTC medications are currently in your home?

Appendix 8
Ethics Approval Study 2; Memorial University of Newfoundland

Memorial
University of Newfoundland

Human Investigation Committee
Research and Graduate Studies
Faculty of Medicine
The Health Sciences Centre

May 20, 2003

Reference #01.68

Ms. J. Hatchette
c/o Dr. M. Murray
Division of Community Health
Memorial University of Newfoundland

Dear Ms. Hatchette:

Thank you for taking the time to complete the annual update form for the research study entitled **"Pain management strategies used by young adolescents: Qualitative and quantitative studies; Study 2 – Emphasis on the role of the family"**.

The Chairs of the Human Investigation Committee reviewed your annual update form and granted approval of this study until **July 2004**, at which time you will be contacted for another update. This decision will be reported to the full Human Investigation Committee at the meeting scheduled for **May 29, 2003**.

Sincerely,

Sharon K. Buehler, PhD
Co-Chair
Human Investigation Committee

Richard S. Neuman, PhD
Co-Chair
Human Investigation Committee

SKB;RSN\jjm

C Dr. C. Loomis, Vice-President (Research), MUN

St. John's, NL, Canada A1B 3V6 • Tel.: (709) 777-6974 • Fax: (709) 777-7581 • email: [illegible]

Appendix 9
Consent Form; Study 2

Consent Form

Pain management strategies used by young adolescents: Qualitative and quantitative studies

Study 2: Discussions on Pain Management; Adolescents and Parents

Thank you for your interest in this research study. The Pain Research Lab at Dalhousie University is interested in understanding the pain management strategies that adolescents use in order to gain relief from various types of pain. The purpose of this study is to explore how the pain management issues that adolescents express as important emerge within the family. To accomplish this we would like to interview parents and children, in the home, about various aspects of pain, pain management strategies and effectiveness. During the interview session, adolescents and parents will be asked to fill out a brief questionnaire concerning demographic variables such as age, gender, grade (for adolescents), occupation (for parents) and health questions. Participants may omit any questions they do not wish to answer. The interviews will be conducted separately, and where possible interviews with both parents would be desirable. The session would take about 30 minutes per person, lasting approximately 90 minutes at most. These sessions will be audio-taped.

As with all our studies, participation is strictly voluntary and you may withdraw at any time. We will offer your family a $15.00 movie voucher for participation in this study to compensate you for your time.

All information gathered in this study is strictly confidential, and your name will not appear on any of the forms or audio-tapes. Audio-tapes of the interviews will be transcribed by a research assistant . The tapes and transcripts will be stored in a locked cabinet at Dalhousie University and kept for 5 years; only the Researcher Coordinator and Research Assistant will have access to the tapes and transcripts. All information gathered in this study is strictly confidential, and your name will not appear on any of the forms. Individual data will not be identifiable and only group data will be published in peer reviewed journals.

In terms of the risks associated with this research, participants should be aware of two issues. First, although the information adolescents provide to the researcher will be held in confidence, in extreme circumstances where the adolescent is believed to be engaging in behavior that is a serious risk to their well-being, the researcher will be obligated to break confidentiality and inform parents in order to ensure the safety of the adolescent. Second, the subject matter to be discussed during the interviews may raise sensitive issues for some adolescents and parents. Every effort will be made to make these interviews as relaxed and informal as possible.

There are no specific benefits to taking part in this study, but the information gathered will help us to better understand pain management strategies employed by adolescents. If you are interested in a copy of the results of this study, please inform the research assistant who will ensure that a copy is sent to you once available.

Individuals with specific concerns may contact Dr. Patrick J. McGrath or Jill Hatchette at 494-1938 or the Psychology Ethics Committee at 494-1580.

Please sign below if you agree to participate in this study with your child.

_____	_____
Name of parent (Please print)	Name of adolescent (Please print)
_____	_____
Signature of parent	Signature of adolescent

Date:_____

Please sign below if you agree to have interview sessions audio-taped.

_____	_____
Signature of parent	Signature of adolescent

Date:_____

How can we reach you? Please leave your telephone number and the best time of day during which we can contact you.

Telephone number _____

Best time to contact you _____

Appendix 10
Pain Incident Questionnaire

Adolescent: Age: _____ **Grade:** _____

Parent: Age: _____

Gender: male ☐ female ☐

(1.) **How many pain episodes have you had in the last month?** _____

(2.) **What type of pain was your most recent episode?** _____

(3.) **How long did your most recent pain episode last (in days or hours)?** _____

(4.) **On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the pain experienced in your most recent pain episode.** _____

(5.) **How did you treat your most recent pain episode?** _____

(6.) **Do you suffer from a chronic or recurrent condition that causes pain?** Yes ☐ No ☐

If yes, continue with Questions 7 – 11.

(7.) **Where is your chronic or recurrent pain?** _____

(8.) **What causes your chronic or recurrent pain?** _____

(9.) **How often do you experience chronic or recurrent pain? (number of times per month)** _____

(10.) **Do you take prescription medications for chronic or recurrent pain?** Yes ☐ No ☐

(11.) **If yes, what type?** _____ **If yes, what dose?** _____

For female participants only:

(12.) **Do you experience menstrual pain?** Yes ☐ No ☐

(13.) **How long does your menstrual pain usually last?** (in days or hours) _____

(14.) **On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the menstrual pain experienced during your most recent period.** _____

(15.) **What did you use to relieve your most recent menstrual pain episode?**

_____

Appendix 11
Pain Incident Questionnaire Codebook

Adolescent = 1
Age: _____ Grade: _____

Parent = 2
Age: _____

Gender: **male = 1 female = 2**

(1.) How many pain episodes have you had in the last month? _____

(2.) What type of pain was your most recent episode?

1 = chest
2 = muscle
3 = joint
4 = sprain
5 = orthodontal
6 = head
7 = bone break
8 = back
9 = menstrual
10 = migraine
11 = stomach
12 = none
13 = acute episode

(3.) How long did your most recent pain episode last (in days or hours)?

1 = 0 – 6 hours
2 = 7 – 12 hours
3 = 13 – 18 hours
4 = 19 – 24 hours
5 = 1 day
6 = 2 – 4 days
7 = 4 + days

(4.) On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the pain experienced in your most recent pain episode. _____

(5.) How did you treat your most recent pain episode?

1 = no treatment
2 = relaxation/ rest
3 = ice
4 = tape/wrap
5 = work out/exercise
6 = visit a physician
7 = ibuprofen (e.g. Motrin®, Midol®, Advil®)
8 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)
9 = acetaminophen and ibuprofen
10 = peroxide
11 = cast
12 = celecoxib (i.e. Celebrex®)
13 = naproxen (i.e. Anaprox®)
14 = acetaminophen and rest (e.g. Tylenol®, Excedrin®, Pamprin®)
15 = ibuprofen and rest (e.g. Motrin®, Midol®, Advil®)

(6.) Do you suffer from a chronic or recurrent condition that causes pain? **Yes = 1 No = 2**

If yes, continue with Questions 7 – 11.

(7.) Where is your chronic or recurrent pain?

1 = back
2 = knees
3 = back and knees
4 = menstrual
5 = chest
6 = head
7 = stomach
8 = heels
9 = ankles

(8.) What causes your chronic or recurrent pain?

1 = sports
2 = menstruation
3 = migraine
4 = asthma

(9.) How often do you experience chronic or recurrent pain? (number of times per month)
1 = 1- 10

2 = 11 – 20
3 = 21 – 30
4 = 31 – 40
5 = 41 – 50

(10.) Do you take prescription medications for chronic or recurrent pain? **Yes = 1 No = 2**

(11.) If yes, what type? _____ If yes, what dose? Omitted from analyses

1 = Naproxen (e.g. Anaprox®)
2 = anti-inflammatory
3 = steroid nasal spray
4 = celexocib (e.g. Celebrex®)
5 = indomethacin (e.g. Indocin®)
6 = ketrolac (e.g. Toradol®)
7 = novoprofen

For female participants only:

(12.) Do you experience menstrual pain? **Yes = 1 No = 2**

(13.) How long does your menstrual pain usually last? (in days or hours)

1 = 0 – 6 hours
2 = 7 – 12 hours
3 = 13 – 18 hours
4 = 19 – 24 hours
5 = 1 day
6 = 2 – 4 days
7 = 4 + days
8 = variable

(14.) On a scale of 1 to 10, where 1 is not intense at all and 10 is extremely intense, rate the intensity of the menstrual pain experienced during your most recent period.

(15.) What did you use to relieve your most recent menstrual pain episode?

1 = ibuprofen (e.g. Motrin®, Midol®, Advil®)
2 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)
3 = naproxen (i.e. Anaprox®)
4 = acetaminophen and ibuprofen
5 = work out/exercise
6 = no treatment
7 = heat

Appendix 14
Parent Consent; Study 3

PARENTAL OR GUARDIAN CONSENT

Thank you for your interest in this project. The Pain Research Lab at Dalhousie University is interested in understanding the pain management strategies that adolescents and their parents or guardians use in order to gain relief from various types of pain. The purpose of this study is to determine the types of pain experienced, attitudes toward pain relief preparations and knowledge of various forms of available pain relief preparations. To accomplish this we would like to conduct telephone interviews, with parents or guardians and children, through which you would be asked to respond to various structured questions. Where possible, it would be beneficial to interview both parents or guardians. The interviews will take approximately 15 minutes per person, for a total time of approximately 45 minutes.

As with all of our studies, participation is strictly voluntary and you may withdraw at any time. We will offer you a $15.00 movie voucher for participation in this study to compensate you for your time.

All information gathered from adolescents and their parents or guardians is strictly confidential and your name will not appear on any of the forms. Forms will be stored in a locked cabinet at Dalhousie University and kept for 5 years; only the Research Coordinator and Research Assistant will have access to the forms. Individual data will not be identifiable and only group data will be published in peer reviewed journals.

In terms of the risks associated with this research, participants should be aware of two issues. First, although the information adolescents provide to the researcher will be held in confidence, in extreme circumstances where the adolescent is believed to be engaging in behavior that is a serious risk to their well-being (e.g. apparent abuse of or addiction to analgesics), the researcher will be obligated to break confidentiality and inform parents in order to ensure the safety of the adolescent. Second, the subject matter to be discussed during the interviews may raise sensitive issues for some adolescents and parents. Every effort will be made to make these interviews as relaxed and informal as possible.

There are no specific benefits to taking part in this study, but the information gathered will help us to better understand pain management strategies employed by adolescents. If you are interested in a copy of the results of this study, please inform the research assistant who will ensure that a copy is sent to you once available.

Individuals with specific concerns may contact Dr. Patrick J. McGrath or Jill Hatchette at 494-1938 or the Psychology Ethics Committee at 494-1580.

I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realise that my participation is voluntary and that I am free to withdraw from the study at any time.

Please sign below if you agree to participate in this study.

_____
Name (Please Print)

_____
Signature

_____
Date

Appendix 15
Adolescent Consent; Study 3

ADOLESCENT CONSENT

Thank you for your interest in this project. The Pain Research Lab at Dalhousie University is interested in understanding the pain management strategies that adolescents and their parents or guardians use in order to gain relief from various types of pain. The purpose of this study is to determine the types of pain experienced, attitudes toward pain relief preparations and knowledge of various forms of available pain relief preparations. To accomplish this we would like to conduct telephone interviews, with parents or guardians and children, through which you would be asked to respond to various structured questions. Where possible, it would be beneficial to interview both parents or guardians. The interviews will take approximately 15 minutes per person, for a total time of approximately 45 minutes.

As with all of our studies, participation is strictly voluntary and you may withdraw at any time. We will offer you a $15.00 movie voucher for participation in this study to compensate you for your time.

All information gathered from adolescents and their parents or guardians is strictly confidential and your name will not appear on any of the forms. Forms will be stored in a locked cabinet at Dalhousie University and kept for 5 years; only the Research Coordinator and Research Assistant will have access to the forms. Individual data will not be identifiable and only group data will be published in peer reviewed journals.

In terms of the risks associated with this research, participants should be aware of two issues. First, although the information adolescents provide to the researcher will be held in confidence, in extreme circumstances where the adolescent is believed to be engaging in behavior that is a serious risk to their well-being (e.g. apparent abuse of or addiction to analgesics), the researcher will be obligated to break confidentiality and inform parents or guardians in order to ensure the safety of the adolescent. Second, the subject matter to be discussed during the interviews may raise sensitive issues for some adolescents and parents or guardians. Every effort will be made to make these interviews as relaxed and informal as possible.

There are no specific benefits to taking part in this study, but the information gathered will help us to better understand pain management strategies employed by adolescents. If you are interested in a copy of the results of this study, please inform the research assistant who will ensure that a copy is sent to you once available.

Individuals with specific concerns may contact Dr. Patrick J. McGrath or Jill Hatchette at 494-1938 or the Psychology Ethics Committee at 494-1580.

I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby assent (agree), with my parent's or guardian's signed consent, to take part in this study. However, I realise that my participation is voluntary and that I am free to withdraw from the study at any time.

Adolescent: Please sign below if you assent (agree) to participating in this study.

_____
Name (Please Print)

_____
Signature

_____
Date

Parent or Guardian: Please sign below if you consent to your child participating in this study.

_____
Name (Please Print)

_____
Signature

_____
Date

Appendix 16
Pain Management Questionnaire

Demographics

Adolescent	*Parent*
Age:	Age:
Grade:	Occupation:
Gender:	Gender:

PART I – *Pain Questionnaire*

This section contains questions regarding 5 common types of pain. For each type of pain you will be asked a question on pain frequency, pain intensity and pain management.

1. HEAD PAIN **(a.)** How many times during the past three months have you had a headache?	**0 1-5 6-10 11-15 16-25 26+**
(b.) On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent headache?	**0 1 2 3 4 5 6 7 8 9 10**
(c.) How many times have you taken medication for a headache over the past three months?	**0 1-5 6-10 11-15 16-25 26+**
(d.) What type(s) of medication did you use?	**Medication(s):**
(e.) What dose of this (these) medication(s) did you use?	**Dose:**
(f.) For how long did you take this (these) medication(s)?	**Duration:**
2. STOMACH PAIN **(a.)** How many times during the past three months have you had a stomach ache?	**0 1-5 6-10 11-15 16-25 26+**

(b.) On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent stomach ache?	**0 1 2 3 4 5 6 7 8 9 10**
(c.) How many times have you taken medication for a stomach ache over the past three months?	**0 1-5 6-10 11-15 16-25 26+**
(d.) What type(s) of medication did you use?	**Medication(s):**
(e.) What dose of this (these) medication(s) did you use?	**Dose:**
(f.) For how long did you take this (these) medication(s)?	**Duration:**
3. EAR/THROAT PAIN	
(a.) How many times during the past three months have you had an ear ache or sore throat?	**0 1-5 6-10 11-15 16-25 26+**
(b.) On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent ear ache or sore throat?	**0 1 2 3 4 5 6 7 8 9 10**
(c.) How many times have you taken medication for an ear ache or sore throat over the past three months?	**0 1-5 6-10 11-15 16-25 26+**
(d.) What type(s) of medication did you use?	**Medication(s):**
(e.) What dose of this (these) medication(s) did you use?	**Dose:**
(f.) For how long did you take this (these) medication(s)?	**Duration:**
4. MUSCLE PAIN	
(a.) How many times during the past three months have you had a muscle ache?	**0 1-5 6-10 11-15 16-25 26+**
(b.) On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent muscle ache?	**0 1 2 3 4 5 6 7 8 9 10**
(c.) How many times have you taken medication for a muscle ache over the past three months?	**0 1-5 6-10 11-15 16-25 26+**

(d.) What type(s) of medication did you use? **(e.)** What dose of this (these) medication(s) did you use? **(f.)** For how long did you take this (these) medication(s)?	**Medication(s):** **Dose:** **Duration:**
5. **MENSTRUAL PAIN** (*female participants only*) **(a.)** How many times during the past three months have you had menstrual pain? **(b.)** On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent menstrual pain? **(c.)** How many times have you taken medication for menstrual pain over the past three months? **(d.)** What type(s) of medication did you use? **(e.)** What dose of this (these) medication(s) did you use? **(f.)** For how long did you take this (these) medication(s)?	 **0 1-5 6-10 11-15 16-25 26+** **0 1 2 3 4 5 6 7 8 9 10** **0 1-5 6-10 11-15 16-25 26+** **Medication(s):** **Dose:** **Duration:**

PART II – ***Attitudes Toward Over-the-Counter (OTC) Medication***

This section contains 18 statements about over-the-counter medications. You will be asked whether you agree or disagree with each statement by indicating a number on a scale of one to five.

1 = strongly disagree 2 = disagree 3 = don't know 4 = agree 5 = strongly agree

1. One should minimize their use of OTC medications because of side effects.	**5**	**4**	**3**	**2**	**1**
2. Side effects are something you need to worry about when taking OTC medications.	**5**	**4**	**3**	**2**	**1**
3. OTC medications are safe because they	**5**	**4**	**3**	**2**	**1**

have no side effects.					
4. OTC medication works best when you take as little as possible.	**5**	**4**	**3**	**2**	**1**
5. OTC medication works best if you save it for when your pain is quite bad.	**5**	**4**	**3**	**2**	**1**
6. The less often I take OTC medication for pain the better the medication will work.	**5**	**4**	**3**	**2**	**1**
7. If I start taking OTC medications for pain, I will always have to take OTC medications for pain.	**5**	**4**	**3**	**2**	**1**
8. If you follow the instructions, taking OTC medications do not become a habit.	**5**	**4**	**3**	**2**	**1**
9. OTC medications are addictive.	**5**	**4**	**3**	**2**	**1**
10. OTC medication use can lead to later drug abuse.	**5**	**4**	**3**	**2**	**1**
11. Young persons learn to use OTC medications responsibly when it is given for pain.	**5**	**4**	**3**	**2**	**1**
12. Taking OTC medications for pain leads to taking OTC medications for problems not related to pain.	**5**	**4**	**3**	**2**	**1**
13. OTC medication is not necessary for temporary pain or discomfort.	**5**	**4**	**3**	**2**	**1**
14. Taking OTC medication for pain or discomfort decreases one's tolerance for pain.	**5**	**4**	**3**	**2**	**1**
15. Putting up with pain and discomfort can make you physically stronger.	**5**	**4**	**3**	**2**	**1**
16. OTC medication can be harmful or lethal in large doses.	**5**	**4**	**3**	**2**	**1**
17. OTC medication adversely effects the liver.	**5**	**4**	**3**	**2**	**1**
18. OTC medication is safe to give to children.	**5**	**4**	**3**	**2**	**1**

PART III – *Knowledge Questionnaire*

This section contains 25 questions about OTC medications. Please answer with a "yes" or "no".

1. Can acetaminophen (e.g. Tylenol®) be used to reduce a fever?	**Yes** **No**
2. Can acetaminophen (e.g. Tylenol®) be used to reduce swelling (e.g. from a sprain)?	**Yes** **No**
3. Can acetaminophen (e.g. Tylenol®) be taken to relieve mild to moderate pain?	**Yes** **No**
4. Is it harmful to exceed a regular dose of acetaminophen (e.g. Tylenol®)?	**Yes** **No**
5. Can 30 – 45 regular acetaminophen (e.g. Tylenol®) tablets cause poisoning?	**Yes** **No**
6. Can exceeding regular doses of acetaminophen (e.g. Tylenol®) cause kidney failure?	**Yes** **No**
7. Should the use of acetaminophen (e.g. Tylenol®) tablets exceed 12 regular tablets a day?	**Yes** **No**
8. Should ASA (e.g. Aspirin®) be used in children less than 16 years old?	**Yes** **No**
9. Is it safe to use ASA (e.g. Aspirin®) for persistent pain that lasts more than 20 days?	**Yes** **No**
10. Can the chronic use of ASA (e.g. Aspirin®) cause ulcers?	**Yes** **No**
11. Is ASA (e.g. Aspirin®) effective for back pain relief?	**Yes** **No**
12. Can ASA (e.g. Aspirin®) reduce pain due to sprains?	**Yes** **No**

13. Is the regular dose of ASA (e.g. Aspirin®) 4 – 6 timer per day?	**Yes** **No**
14. Is it better to use less than the recommended amount of any OTC pain medication?	**Yes** **No**
15. Is it best to wait until the pain is quite bad to take OTC medications?	**Yes** **No**
16. Can chronic doses of ASA (e.g. Aspirin®) cause internal bleeding?	**Yes** **No**
17. Is 3 grams of ASA (e.g. Aspirin®) per day considered a high dose?	**Yes** **No**
18. Female only – Is ibuprofen (e.g. Advil) effective in reducing menstrual pain?	**Yes** **No**
19. Can ibuprofen (e.g. Advil®) reduce fever?	**Yes** **No**
20. Does the amount of pain medication one takes depend on body weight?	**Yes** **No**
21. Can an overdose of acetaminophen (e.g. Tylenol®) kill you?	**Yes** **No**
22. Is 30 acetaminophen (e.g. Tylenol®) tablets enough to be considered dangerous?	**Yes** **No**
23. Is the regular dose of ibuprofen (e.g. Tylenol®) 200 – 400 milligrams every 4 hours?	**Yes** **No**
24. Would 6 ibuprofen (e.g. Advil®) tablets in one day exceed recommended dosage?	**Yes** **No**
25. Is ASA (e.g. Aspirin®) considered safer than ibuprofen?	**Yes** **No**

Appendix 17
Pain Management Questionnaire: Code Book

Demographics

Adolescent

Age:
Grade:

7 = grade 7
8 = grade 8
9 = grade 9

Gender: 1=male 2=female

Parent

Age:
Occupation:

1 = homemaker
2 = health care
3 = financial services
4 = education
5 = social work
6 = management
10 = sales
11 = civil servant
12 = secretary
13 = other
14 = marketing

Gender: 1=male 2=female

PART I – *Pain Questionnaire*

This section contains questions regarding 5 common types of pain. For each type of pain you will be asked a question on pain frequency, pain intensity and pain management.

6. HEAD PAIN	**0 1 2 3 4 5**
(a.) How many times during the past three months have you had a headache?	0 1-5 6-10 11-15 16-25 26+
(b.) On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of	0 1 2 3 4 5 6 7 8 9 10

your most recent headache? **(c.)** How many times have you taken medication for a headache over the past three months? **(d.)** What type(s) of medication did you use? **(e.)** What dose of this (these) medication(s) did you use? **(f.)** For how long did you take this (these) medication(s)?	**0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ Medication(s): **1 = ibuprofen (e.g. Motrin®, Midol®, Advil®)** **2 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)** **3 = ASA (Aspirin®, Entrophen®)** **4 = methocarbonol (e.g. Robaxacet®)** **5 = ketrolac (e.g. Torodol®)** **6 = sumatriptan (e.g.Imitrex®)** **7 = rizatriptan (e.g. Maxalt®)** **8 = non-pharmacological/other (e.g. Halls®, Deep Heat®, antacids, lozenges)** **9 = combination ibuprofen/acetaminophen** **10 = antibiotics** **11 = naproxen (e.g. Anaprox®, Aleve®)** Dose: omitted from analyses Duration: omitted from analyses
7. STOMACH PAIN **(a.)** How many times during the past three months have you had a stomach ache? **(b.)** On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent stomach ache? **(c.)** How many times have you taken medication for a stomach ache over the past three months? **(d.)** What type(s) of medication did you use?	**0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ 0 1 2 3 4 5 6 7 8 9 10 **0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ Medication(s): **1 = ibuprofen (e.g. Motrin®,**

(e.) What dose of this (these) medication(s) did you use? **(f.)** For how long did you take this (these) medication(s)?	**Midol®, Advil®)** **2 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)** **3 = ASA (Aspirin®, Entrophen®)** **4 = methocarbonol (e.g. Robaxacet®)** **5 = ketrolac (e.g. Torodol®)** **6 = sumatriptan (e.g.Imitrex®)** **7 = rizatriptan (e.g. Maxalt®)** **8 = non-pharmacological/other (e.g. Halls®, Deep Heat®, antacids, lozenges)** **9 = combination ibuprofen/acetaminophen** **10 = antibiotics** **11 = naproxen (e.g. Anaprox®, Aleve®)** Dose: omitted from analyses Duration: omitted from analyses
8. EAR/THROAT PAIN **(a.)** How many times during the past three months have you had an ear ache or sore throat? **(b.)** On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent ear ache or sore throat? **(c.)** How many times have you taken medication for an ear ache or sore throat over the past three months? **(d.)** What type(s) of medication did you use? **(e.)** What dose of this (these) medication(s) did you use? **(f.)** For how long did you take this (these) medication(s)?	**0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ 0 1 2 3 4 5 6 7 8 9 10 **0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ Medication(s): **1 = ibuprofen (e.g. Motrin®, Midol®, Advil®)** **2 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)** **3 = ASA (Aspirin®, Entrophen®)** **4 = methocarbonol (e.g. Robaxacet®)** **5 = ketrolac (e.g. Torodol®)** **6 = sumatriptan (e.g.Imitrex®)** **7 = rizatriptan (e.g. Maxalt®)**

	8 = non-pharmacological/other (e.g. Halls®, Deep Heat®, antacids, lozenges) **9 = combination ibuprofen/acetaminophen** **10 = antibiotics** **11 = naproxen (e.g. Anaprox®, Aleve®)** Dose: omitted from analyses Duration: omitted from analyses
9. MUSCLE PAIN **(a.)** How many times during the past three months have you had a muscle ache? **(b.)** On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent muscle ache? **(c.)** How many times have you taken medication for a muscle ache over the past three months? **(d.)** What type(s) of medication did you use? **(e.)** What dose of this (these) medication(s) did you use? **(f.)** For how long did you take this (these) medication(s)?	**0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ 0 1 2 3 4 5 6 7 8 9 10 **0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ Medication(s): **1 = ibuprofen (e.g. Motrin®, Midol®, Advil®)** **2 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)** **3 = ASA (Aspirin®, Entrophen®)** **4 = methocarbonol (e.g. Robaxacet®)** **5 = ketrolac (e.g. Torodol®)** **6 = sumatriptan (e.g.Imitrex®)** **7 = rizatriptan (e.g. Maxalt®)** **8 = non-pharmacological/other (e.g. Halls®, Deep Heat®, antacids, lozenges)** **9 = combination ibuprofen/acetaminophen** **10 = antibiotics** **11 = naproxen (e.g. Anaprox®, Aleve®)**

	Dose: omitted from analyses Duration: omitted from analyses
10. **MENSTRUAL PAIN** (*female participants only*) **(a.)** How many times during the past three months have you had menstrual pain? **(b.)** On a scale of zero (no pain) to ten (worst pain possible) how would you rate the average intensity of your most recent menstrual pain? **(c.)** How many times have you taken medication for menstrual pain over the past three months? **(d.)** What type(s) of medication did you use? **(e.)** What dose of this (these) medication(s) did you use? **(f.)** For how long did you take this (these) medication(s)?	**0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ 0 1 2 3 4 5 6 7 8 9 10 **0 1 2 3 4 5** 0 1-5 6-10 11-15 16-25 26+ Medication(s): **1 = ibuprofen (e.g. Motrin®, Midol®, Advil®)** **2 = acetaminophen (e.g. Tylenol®, Excedrin®, Pamprin®)** **3 = ASA (Aspirin®, Entrophen®)** **4 = methocarbonol (e.g. Robaxacet®)** **5 = ketrolac (e.g. Torodol®)** **6 = sumatriptan (e.g.Imitrex®)** **7 = rizatriptan (e.g. Maxalt®)** **8 = non-pharmacological/other (e.g. Halls®, Deep Heat®, antacids, lozenges)** **9 = combination ibuprofen/acetaminophen** **10 = antibiotics** **11 = naproxen (e.g. Anaprox®, Aleve®)** Dose: omitted from analyses Duration: omitted from analyses

PART II – *Attitudes Toward Over-the-Counter (OTC) Medication*

This section contains 18 statements about over-the-counter medications. You will be asked whether you agree or disagree with each statement by indicating a number on a scale of one to five.

1 = strongly disagree 2 = disagree 3 = don't know 4 = agree 5 = strongly agree

SIDE EFFECTS SUBSCALE					
1. One should minimize their use of OTC medications because of side effects. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
2. Side effects are something you need to worry about when taking OTC medications. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
3. OTC medications are safe because they have no side effects.	**5**	**4**	**3**	**2**	**1**
TOLERANCE SUBSCALE					
4. OTC medication works best when you take as little as possible. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
5. OTC medication works best if you save it for when your pain is quite bad. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
6. The less often I take OTC medication for pain the better the medication will work. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
ADDICTION SUBSCALE					
7. If I start taking OTC medications for pain, I will always have to take OTC	5	4	3	2	1

medications for pain. **REVERSE ORDERED**	**1**	**2**	**3**	**4**	**5**
8. If you follow the instructions, taking OTC medications do not become a habit.	**5**	**4**	**3**	**2**	**1**
9. OTC medications are addictive. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
DRUG ABUSE SUBSCALE					
10. OTC medication use can lead to later drug abuse. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
11. Young persons learn to use OTC medications responsibly when it is given for pain.	**5**	**4**	**3**	**2**	**1**
12. Taking OTC medications for pain leads to taking OTC medications for problems not related to pain. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
STOICISM SUBSCALE					
13. OTC medication is not necessary for temporary pain or discomfort.	**5**	**4**	**3**	**2**	**1**
14. Taking OTC medication for pain or discomfort decreases one's tolerance for pain. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
15. Putting up with pain and discomfort can make you physically stronger. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
HARM SUBSCALE					
16. OTC medication can be harmful or lethal in large doses.	**5**	**4**	**3**	**2**	**1**

17. OTC medication adversely effects the liver. **REVERSE ORDERED**	5 **1**	4 **2**	3 **3**	2 **4**	1 **5**
18. OTC medication is safe to give to children.	**5**	**4**	**3**	**2**	**1**

PART III – *Knowledge Questionnaire*

This section contains 25 questions about OTC medications. Please answer with a "yes" or "no".
Correct responses are denoted with "✕".
Correct response = 1

Incorrect response = 0

1. Can acetaminophen (e.g. Tylenol®) be used to reduce a fever?	**Yes ✕** No
2. Can acetaminophen (e.g. Tylenol®) be used to reduce swelling (e.g. from a sprain)?	Yes **No ✕**
3. Can acetaminophen (e.g. Tylenol®) be taken to relieve mild to moderate pain?	**Yes ✕** No
4. Is it harmful to exceed a regular dose of acetaminophen (e.g. Tylenol®)?	**Yes ✕** No
5. Can 30 – 45 regular acetaminophen (e.g. Tylenol®) tablets cause poisoning?	**Yes ✕** No
6. Can exceeding regular doses of acetaminophen (e.g. Tylenol®) cause kidney failure?	Yes **No ✕**
7. Should the use of acetaminophen (e.g. Tylenol®) tablets exceed 12 regular tablets a day?	Yes **No ✕**
8. Should ASA (e.g. Aspirin®) be used in children less than 16 years old?	Yes **No ✕**
9. Is it safe to use ASA (e.g. Aspirin®) for persistent pain that lasts more than 20 days?	Yes **No ✕**
10. Can the chronic use of ASA (e.g. Aspirin®) cause ulcers?	**Yes ✕** No
11. Is ASA (e.g. Aspirin®) effective for back pain relief?	**Yes ✕** No
12. Can ASA (e.g. Aspirin®) reduce pain due to sprains?	**Yes ✕** No
13. Is the regular dose of ASA (e.g. Aspirin®) 4 – 6 timer per day?	**Yes ✕** No
14. Is it better to use less than the recommended amount of any OTC pain medication?	Yes **No ✕**
15. Is it best to wait until the pain is quite bad to take OTC medications?	Yes **No ✕**
16. Can chronic doses of ASA (e.g. Aspirin®) cause internal bleeding?	**Yes ✕** No

17. Is 3 grams of ASA (e.g. Aspirin®) per day considered a high dose?	**Yes** ✕ No
18. Female only – Is ibuprofen (e.g. Advil) effective in reducing menstrual pain?	**Yes** ✕ No
19. Can ibuprofen (e.g. Advil®) reduce fever?	**Yes** ✕ No
20. Does the amount of pain medication one takes depend on body weight?	**Yes** ✕ No
21. Can an overdose of acetaminophen (e.g. Tylenol®) kill you?	**Yes** ✕ No
22. Is 30 acetaminophen (e.g. Tylenol®) tablets enough to be considered dangerous?	**Yes** ✕ No
23. Is the regular dose of ibuprofen (e.g. Tylenol®) 200 – 400 milligrams every 4 hours?	**Yes** ✕ No
24. Would 6 ibuprofen (e.g. Advil®) tablets in one day exceed recommended dosage?	Yes **No** ✕
25. Is ASA (e.g. Aspirin®) considered safer than ibuprofen?	Yes **No** ✕

Appendix 18
Frequencies of Major Pain Types.

Table 20
Actual Numbers of Parents and Adolescents Experiencing Various Frequencies of Four Primary Pain Types (N=278).

		Parent	Male Adolescent	Female Adolescent
Head Pain	Number of episodes in previous three months			
	0	70	37	55
	1-5	22	10	12
	6-10	27	3	11
	11-15	7	0	7
	16-25	6	0	4
	26+	7	0	0
	Total	139	50	89
Stomach Pain	Number of episodes in previous three months			
	0	126	45	78
	1-5	11	5	8
	6-10	1	0	1
	11-15	1	0	1
	16-25	0	0	0
	26+	0	0	0
	Total	139	50	89
Ear/Throat Pain	Number of episodes in previous three months			
	0	125	43	78
	1-5	13	7	8
	6-10	1	0	1
	11-15	0	0	1
	16-25	0	0	0
	26+	0	0	0
	Total	139	139	89
Muscle Pain	Number of episodes in previous three months			
	0	91	31	70
	1-5	18	14	13
	6-10	9	4	4
	11-15	9	0	0
	16-25	1	1	0
	26+	10	0	2
	Total	139	50	89

Appendix 19a
Frequencies of Parents' Pain Intensity Ratings.

Table 21
Actual Number of Parents at Each Pain Intensity Rating for Four Primary Pain Types (N=139).

Pain Intensity Rating	Head Pain	Stomach Pain	Ear/Throat Pain	Muscle Pain
0 (no pain at all)	1	1	0	0
1	0	1	0	0
2	0	0	0	0
3	0	1	0	1
4	3	1	0	1
5	9	2	4	16
6	13	2	0	2
7	6	1	1	6
8	22	2	6	15
9	3	0	2	2
10 (worst pain imaginable)	12	2	1	4
Not Applicable	70	126	125	92
Total	139	139	139	139

Appendix 19b
Frequencies of Adolescents' Pain Intensity Ratings.

Table 22
Actual Number of Adolescents at Each Pain Intensity Rating For Four Primary Pain Types (N=139).

	Male Adolescent				Female Adolescent			
Pain Intensity Rating	Head Pain	Stomach Pain	Ear/Throat Pain	Muscle Pain	Head Pain	Stomach Pain	Ear/Throat Pain	Muscle Pain
0 (no pain at all)	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0	0
2	0	0	0	0	0	1	0	0
3	0	0	0	1	0	0	0	0
4	0	0	1	0	0	2	0	0
5	4	2	4	4	3	4	3	8
6	1	0	0	3	3	1	0	0
7	0	0	0	0	0	1	0	2
8	5	1	0	4	15	0	0	3
9	0	0	1	1	3	0	1	0
10 (worst pain imaginable)	3	2	1	6	9	2	6	5
Not Applicable	37	45	43	31	55	78	79	71
Total	50	50	50	50	89	89	89	89

Appendix 20
Frequency of Medication Use.

Table 23

Actual Number of Parents and Adolescents at Each Medicating Frequency Level for Four Primary Pain Types (N=278).

		Parent	Male Adolescent	Female Adolescent
Head Pain	Frequency of medication use in previous three months			
	0	5	2	7
	1-5	23	8	11
	6-10	23	2	11
	11-15	7	0	5
	16-25	4	0	3
	26+	6	0	0
	Not Applicable	71	37	57
	Total	139	50	89
Stomach Pain	Frequency of medication use in previous three months			
	0	5	3	7
	1-5	6	2	2
	6-10	1	0	1
	11-15	0	0	1
	16-25	0	0	0
	26+	0	0	0
	Not Applicable	127	45	78
	Total	139	50	89
Ear/Throat Pain	Frequency of medication use in previous three months			
	0	4	3	2
	1-5	9	4	6
	6-10	1	0	1
	11-15	0	0	1
	16-25	0	0	0
	26+	0	0	0
	Not Applicable	125	50	79
	Total	139	139	89
Muscle Pain	Frequency of medication use in previous three months			
	0	13	6	7
	1-5	13	9	8
	6-10	10	3	2
	11-15	6	0	2
	16-25	1	0	0
	26+	4	1	0
	Not Applicable	92	31	70
	Total	139	50	89

Appendix 21a
Frequencies of Parent Attitude Scores

Table 24

Actual Number of Parents at Each Attitude Score Level for Attitude Measure Subscales (N=139).

Score[1]	Side Effects Subscale	Tolerance Subscale	Addiction Subscale	Abuse Subscale	Stoicism Subscale	Harm Subscale
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	26	17	10	10	0	1
4	10	0	1	1	0	2
5	14	11	4	4	0	5
6	29	16	15	15	0	3
7	17	3	23	23	5	49
8	6	3	15	15	0	27
9	8	7	17	17	7	19
10	1	19	22	22	25	17
11	2	29	24	24	29	15
12	4	8	5	5	24	0
13	6	8	3	3	14	1
14	6	4	0	0	13	0
15	10	14	0	0	22	0
Total	139	139	139	139	139	139

1. Minimum score that can be obtained on any subscale of the Attitudes Toward Over-the-Counter Medication measure is 3 and the maximum score that can be obtained is 15. A high score represents a positive attitude.

Appendix 21b
Frequencies of Male Adolescents' Attitude Scores

Table 25

Actual Number of Male Adolescents at Each Attitude Score Level for Attitude Measure Subscales (N=50).

Score[1]	Side Effects Subscale	Tolerance Subscale	Addiction Subscale	Abuse Subscale	Stoicism Subscale	Harm Subscale
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	4	5	1	0	1	0
4	0	0	0	0	0	0
5	2	1	0	0	0	1
6	12	9	0	0	0	1
7	10	8	12	9	4	7
8	5	8	14	8	9	14
9	8	8	8	14	13	14
10	0	1	5	9	11	6
11	1	5	6	7	10	7
12	2	5	3	0	1	0
13	1	0	0	2	0	0
14	3	0	0	1	0	0
15	2	0	1	0	1	0
Total	50	50	50	50	50	50

1. Minimum score that can be obtained on any subscale of the Attitudes Toward Over-the-Counter Medication measure is 3 and the maximum score that can be obtained is 15. A high score represents a positive attitude.

Appendix 21c
Frequencies of Female Adolescents' Attitude Scores.

Table 26

Actual Number of Female Adolescents at Each Attitude Score Level for Attitude Measure Subscales (N=89).

Score[1]	Side Effects Subscale	Tolerance Subscale	Addiction Subscale	Abuse Subscale	Stoicism Subscale	Harm Subscale
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	15	17	0	0	1	0
4	2	0	0	0	0	0
5	3	2	0	4	2	3
6	10	5	2	0	2	4
7	18	9	15	18	10	16
8	7	10	12	12	9	22
9	18	14	21	26	21	21
10	5	6	9	7	12	7
11	2	10	15	14	15	9
12	3	6	6	4	6	4
13	1	4	6	2	6	3
14	3	0	0	0	0	0
15	2	6	3	2	5	0
Total	89	89	89	89	89	89

1. Minimum score that can be obtained on any subscale of the Attitudes Toward Over-the-Counter Medication measure is 3 and the maximum score that can be obtained is 15. A high score represents a positive attitude.

Appendix 22
Frequencies of Knowledge Questionnaire Scores.

Table 27

Actual Numbers of Parents and Adolescents at Each Knowledge Score Level (N=278).

Score	Parent Scores	Male adolescent Scores[1]	Female Adolescent Scores
0	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	1
10	0	0	0
11	0	5	7
12	0	6	4
13	1	6	8
14	1	8	15
15	6	9	9
16	11	6	15
17	10	8	12
18	21	1	5
19	23	0	7
20	24	1	3
21	17	0	1
22	12	0	1
23	6	0	0
24	6	0	1
25	1	0	0
Total	139	50	89

1. Question 18 on the Knowledge Questionnaire dealt specifically with menstruation. Male participants were not required to answer this question. Therefore, knowledge scores for males were out of a maximum of 24.