

**Intervention-Causation Fallacy: Treatment Approach, Gender, Illness
Sensitivity and Prior Knowledge in Attitudes to Fibromyalgia**

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Abstract

Fibromyalgia is a condition that features bodily symptoms along with psychological components which, as yet, has no medically agreed-upon aetiology. Using a quasi-experimental design with a correlational element, the attitudes of 174 college students were measured across three recommended treatments to examine if attitudes to fibromyalgia would vary with treatment approach. As fibromyalgia is prevalent in women, gender differences in attitudes were also explored. This study used the illness/injury sensitivity index to examine the relationship between participants' fears of illness with their attitudes to fibromyalgia, and finally prior knowledge of the disorder was also examined as having a possible effect on attitudes. Results found no significant difference between treatment approach groups or prior knowledge in attitudes. However, a significant difference was found between gender, and a weak positive relationship was found between illness/injury sensitivity and attitudes to fibromyalgia.

Introduction

Advancements in the field of medicine have brought the diagnosis and treatment of mental and physical health problems into the 21st century with a strong biological approach to our understanding of illness. The biomedical model views the mind and the body as functioning in isolation of each other and emphasises the physiological in the cause of bodily dysfunction (Ogden, 2012). This attitude can result in patients rejecting any possible psychological, emotional or social components to their health problems in order to be perceived as being legitimately ill (Showalter, 1998, p.117; May, Rose & Johnstone, 2000). This phenomenon occurs despite the fact that, as Showalter (1998) points out, if an individual experiences pain, it is real regardless of having a psychological or physiological cause.

When patterns of physically manifested symptoms occur in an individual, without any identifiable biological causal factors, they are said to be suffering with a condition that may be labelled as a psychosomatic illness (Sarno, 2014), somatoform disorder (Butcher, Mineka & Hooley, 2010) or functional syndrome (Saperia & Swartzman, 2012). However, according to the DSM 5, an individual disorder cannot be diagnosed as such simply because its medical cause has not *yet* been determined (American Psychiatric Association, 2013). Common examples of conditions with no medically agreed-upon aetiology are irritable bowel syndrome, chronic fatigue syndrome and fibromyalgia (Kim & Chang, 2012; Sarno, 2014). Saperia and Swartzman (2012, p.311) write that despite the high prevalence of disorders that feature symptoms of unknown aetiology, they are still met with sceptical attitudes in the medical community.

Fibromyalgia

Fibromyalgia (FM) is the world's most common chronic musculoskeletal pain condition (Roskell, Beard, Zhao & Kim Le, 2011, p.516) and is the second most common condition in the field of rheumatology (Sarno, 2014, p. 296). Along with the central symptom of chronic widespread pain, FM patients can also suffer from fatigue, cognitive difficulties, sleep disturbances and headaches (Roskell et al, 2011). Additional reported symptoms include hypersensitivity to temperature and noise (Pérez-Pareja, Sesé, González-Ordi & Palmer, 2010) and contributing psychological factors such as anxiety, depression, stress and experiences of emotional trauma (Ryan, 2013). With no identifiable biomarkers, FM cannot be directly tested, leaving self-reports of sufferers as means of diagnosis (Friedberg & Jason, 2001; Marcus, Bernstein & Albrecht, 2013). Sarno (2014) writes that in recent decades this disorder has reached epidemic proportions (p.18) with 0.5% to 5% of the world's population affected (Ryan, 2013). Most of the research on FM acknowledges the confusion surrounding criteria, diagnosis and treatment for the disorder (Hayes et al, 2010; Cedraschi et al, 2012) and adding to said confusion, the main symptoms (pain and fatigue) could be seen as common to everyday life and often experienced, at some level, by most people (Cedraschi et al, 2012, p.1563). Thus validity of the disorder remains controversial (Krsnich-Shriwise, 1997; Dennis, Larkin & Derbyshire, 2013) even to those in the medical practice (Schneider-Edman van Altena, 2008; Hayes et al, 2010) with its psychological and emotional components further obscuring diagnosis (Hayes et al, 2010).

The physician Guillaume de Baillou first referred to a musculoskeletal pain condition, called muscular rheumatism, in 1592 (Inanici & Yunus, 2004, p369) and in the

late 19th century the American neurologist George M. Beard described a condition featuring widespread pain that coexisted with fatigue called neurasthenia, which Beard attributed to the stresses of daily life (Inancini & Yunus, 2004). It was PK Hench who coined the term fibromyalgia in 1976, meaning *pain of the fibrous tissue* (Krsnich-Shriwise, 1997). The first set of criteria published by the American College of Rheumatology in 1990 (Inancini & Yunus, 2004, p.369) stated that if a person had pain that had persisted in 11 out of a possible 18 tender points of bilateral muscle tissue, they were suitable for a diagnosis of FM (Krsnich-Shriwise, 1997). In 2010, this criteria was revised moving away from this set of tender points to focus more on the patients reported symptoms and severity of pain (Wolfe & Häuser, 2011).

Despite decades of studies examining aetiology, no one clear root cause has been found to underlie onset or development of FM (Hayes et al, 2010) however research has been put forward that suggests possible biological origins with evidence of premature neurological aging (Russell & Larson, 2009), lack of connectivity in the neural pain networks (Jensen et al, 2012), and dysfunction in the central nervous system, neurotransmission and immune system of FM sufferers (Bellato et al, 2012). Recent, and influential research conducted by Albrecht et al (2013) revealed excessive sensory nerves in the palms of the hands and soles of the feet of FM patients as a potential root cause. With regards to the non-biological component, a study by Cedraschi et al (2012) found a sample of FM patients to report psychological distress as being highly related to the initial onset of their symptoms. In this qualitative study, of the 56 participants, many described psychologically traumatic episodes (such as the death of a loved one) as concurring with early symptoms, some also specified childhood experiences of violence

and abuse (Cedraschi et al, 2012, p.1565). Martínez et al (2011) also report the contribution of psychological factors such as an individual's personality traits and coping strategies and Pérez- Pareja et al (2010) found expressions of psychopathological and somatic symptoms in FM patients. With regards to the duality between our mind and bodies, Glattacker, Opitz and Jäckel (2010) propose that without further proof of aetiology, FM is best understood as the expression of a combination of “psychosocial, mechanical and biological stressors” (p.368) and Rasker and Hazemeijer (2003) note that “the only certainty in FM is that it is still being diagnosed” (p.507). While there exists in the literature a body of work on the experience of people suffering with FM, little is known about attitudes towards the disorder in the general population.

Attitudes to Fibromyalgia

Hogg and Vaughan (2010) define attitudes as general feelings, beliefs or evaluations that we hold regarding particular individuals or groups (p.94). Attitudes on health have been found in the literature to be linked to attributions, meaning the causal explanations people form about individual illnesses (Hampton & Sharp, 2014) and Mak, Chong and Wong (2014) write that psychosocial, biological, and cultural causal attributions could all affect attitudes in different ways (p.179). Karhausen (2000) writes that the biomedical model attempts to simplify the complexity of abnormal health through the categorisation of agreed-upon criteria of symptoms. One aim of this process of categorisation is to establish single explanatory factors of illness; however this can sometimes lead to errors in causation (Karhausen, 2000, p.63). In their review of the literature of attitudes to chronic fatigue syndrome Shlaes, Jason and Ferrari (1999) write that the discomfort surrounding conditions with unexplained symptoms can lead to a tendency of blaming the

patient for their own suffering and Ryan (2013) reports that FM sufferers often experience guilt over their failure to maintain social and familial relationships as they did before the onset of symptoms. A theory put forward to explain negative attitudes towards illness is called the minority-group model (Shlaes, Jason & Ferrari, 1999) which suggests that those in the majority, being healthy non-sufferers, can begin to isolate or abandon those who are ill or disabled when they are no longer capable of meeting the standards set by the physically able (p.445). This model could be explained by Söder (1990) who writes that attitudes may not in fact be individualistic, but as a result of shared beliefs and values found within a community.

1. Treatment Approach

While there is little research on causal beliefs and attitudes to FM in the previous literature, studies have been conducted to assess how attributions of cause and treatment affect attitudes to other, indirectly related, health problems. In an experimental study by Ogden and Jubb (2008) participants were found to be consistent in their beliefs about the causes and solutions to three different types of problems (obesity, depression and sleep problems). Ogden and Jubb (2008) presented participants with vignettes of illness and found that when the cause of a problem was believed to be biomedical, i.e. the fault of genetics or hormones, participants also believed the solution to be found through biomedical methods (p.9). Similarly, when participants rated a problem as being of psychological origin i.e. resulting from anxiety or life events, they rated the most effective solution as being psychological e.g. counselling (Ogden & Jubb, 2008, p.9). While this suggests causal and solution beliefs to be consistent with each other, they were found to be inconsistent between the problem type (i.e. obesity, depression and sleep),

meaning that their participants' beliefs were illness specific (Ogden & Jubb, 2008, p.2). However a limitation of the experiment identified by the researchers was its use of vignettes which can only measure beliefs in an abstract, not concrete, sense (Ogden & Jubb, 2008, p.15).

In research on the relationship between causal beliefs and attitudes, Read and Law (1999) discovered that beliefs of biomedical causes of mental illness engendered more negative, fearful attitudes amongst participants. When mental health problems were believed to be caused by genetic flaws or chemical abnormalities, Read and Law (1999) found participants attributed the characteristic of unpredictability in sufferers which in turn had a negative effect on their attitudes to people with mental health issues (Read & Law, 1999). This finding was later replicated by Read and Harré (2001) who again found that biological or genetic causal beliefs of mental illness can result in negative attitudes (Read & Harré, 2001). However, a limitation of these studies is that they cannot provide insight for the promotion of more positive attitudes. If biomedical explanations of mental health problems lead to negative attitudes, should future informational interventions be designed with a view to abandoning biological explanations in favour of a psychosocial approach, or should researchers investigate an integration of both explanations when attempting to favourably change attitudes?

Chronic fatigue syndrome (CFS), like FM, lacks a known aetiology (Friedberg & Jason, 2001) and Dickson, Knussen and Flowers (2007) found that contrary to the findings of Read and Law (1999), for individuals with CFS, causal attributions such as psychosocial or functional accounts of their disorder resulted in feelings of de-legitimisation from others towards their symptoms (p.853).

In a mixed methods study by Hayes et al, (2010) on a sample of medical professionals; both general practitioners and specialists revealed interplay between treatment and attitudes towards FM, with self-reported lack of knowledge in how to treat the disorder coinciding with negative attitudes. Qualitative data found themes of disbelief in the legitimacy of FM to be associated with a self-reported lack of skill in treating it, with over 50% of the sample admitting a lack of knowledge for appropriate treatment (Hayes et al, 2010, p.387).

Errors in causation are common according to Levy (1997), who states that when a relationship is found, it is easy to make an assumption that one factor is leading another (p.62). Schacter, Gilbert and Wegner (2012) put forward that when treating disorders of the brain and/or body an error in causation can occur called the *intervention-causation fallacy* meaning “the assumption that if a treatment is effective, it must address the cause of the problem” (p.575). In the case of FM, where no cause is clear, it could be speculated that causal beliefs could be formed based on treatment approach. While no treatment has yet been found to be effective in curing FM (Friedberg & Jason, 2001), there are a wide variety of treatments recommended for the management of its symptoms such as aiding sleep, alleviating pain and easing physical functioning (Roskell et al, 2011; Bellato et al, 2012); treatment approach is therefore usually based on the individual patient’s expression of symptoms and comorbidities (Ryan, 2013, p.41) As research has shown that beliefs about cause and solution are consistent (Ogden & Jubb, 2008) and that causal belief plays a role in the formation of attitudes (Read & Law, 1999; Read & Harré, 2001) could the lack of a universal treatment approach play a part in attitudes towards FM?

2. Gender

Both sex (as a biological variable) and gender (as a cultural variable) play a role in health variation (Ogden, 2012; Miller et al, 2013). Gender appears to underlie several different health behaviours, for examples, women have been found to pay more visits to healthcare practitioners and report more symptoms than men (Kroenke & Spitzer, 1998; Ogden, 2012), express more symptoms of psychological manifestation (Macintyre, Hunt and Sweeting, 1996) and have more positive attitudes regarding people with mental illness (Hampton & Sharp, 2014). In literature looking at attitudes to disability, the sex of the target individual was found to be one of the situational factors that most accounted for variations in attitudes (Berry & Jones, 1991, p.674). Howson (2013) states that within the medical health profession, attitudes towards women's health issues tend to be dismissive (p.165) and one could speculate that differing attitudes of health attributed to women could stem from the belief from traditional psychoanalytic theory that "a woman always at heart remains an hysteric" (Kohon, 1984, p.73). Writing a paper on a rare disease of unknown aetiology called mastocytosis, Sev'er, Sibbald and D'Arville (2009) found that while the illness occurs in both genders, men's symptoms tend to be more readily believed, while female patients are met with scepticism from medical professionals. Oldfield (2013) also writes that it is common for women's reports of pain to be disbelieved and to be accused of faking symptoms.

Attitudinal differences between male and female patients is supported in a much cited study by Broverman et al (1970) who hypothesised that clinical judgments surrounding patients would reflect stereotypes based on masculine versus feminine characteristics. Using a sample of 79 clinicians, Broverman et al's (1970) study asked

participants to rate a given trait as being characteristic of either a healthy male, healthy female or a healthy adult of undisclosed gender. On examination of their findings, Broverman et al (1970) supported their hypothesis and interpreted their participants answers as revealing a “powerful, negative assessment” (p.4) in their attitudes towards women. In an interesting additional finding of this study, negative attitudes towards women were found across the total sample, therefore in both male and female clinicians (Broverman, et al, 1970). However, contrary results were reported by Phillips and Gilroy (1985) who failed to replicate the findings of Broverman et al (1970), proposing that there may have been a progression in attitudes to women within the medical profession since the original study was conducted.

Although it may be true that there has been a progression since Broverman et al’s (1970) study, Barker (1995, as cited by Oldfield, 2013) notes that women are still generally the sufferers of controversial or contested disorders and according to Carranza-Lira and Villalobos Hernandez (2014, p.169) 80-90% FM patients are females. While men are also diagnosed with FM, there is considerably less research conducted with male FM participants and Castro-Sánchez et al (2012) state that studies on any differences in the experiences of men with FM have so far found contradictory results (p.1640). What effect therefore, if any, might the female dominance of FM have on attitudes when the previous literature suggests the existence of many gender health inequalities (Ogden 2012). While there is little research on gender differences in attitudes to FM, it is known that women suffer with more chronic pain disorders than men do (Verbrugge, 1985; Oldfield, 2013) and therefore it could be put forward that FM being a gendered disorder may be a factor in perceptions of the condition.

3. Illness Sensitivity

Verbrugge (1985) states that there are many individual differences within illness behaviours, for example variations are often found in how people perceive, evaluate and report their symptoms. Along with anxiety sensitivity and fear of negative evaluation, illness/injury sensitivity is said to be one of the three fundamental fears (Carleton, Park & Asmundson, 2006; Schützler, Carleton & Witt, 2012) which underlie anxiety related disorders (Thibodeau et al, 2013).

Illness/injury sensitivity relates to a person's fear of illness and/or injury (Thibodeau et al, 2013) and may be derived as a means to avoid real, or imagined, threats to one's health (Carleton, Park & Asmundson, 2006). There are different theories in the literature on its source; Watt et al (2008) suggest these illness/injuries behaviours to be developed in childhood by parental modelling and reinforcements of pain-related behaviours (p138), while inherent fear of illness was explained by Park, Faulkner and Schaller (2003) as *disease-avoidance*; a psychological mechanism evolved to protect us from contracting the diseases of others.

Support for illness/injury sensitivity correlating with FM has been found in the research, for example it has been found to play a role the development of chronic pain disorders such as FM (Tang et al, 2009; Schützler, Carleton & Witt, 2012) and studies on related variables have found pain anxiety (Martínez et al, 2011) and high harm avoidance (Lundberg, Anderberg & Gerdle, 2009) to be high in people with FM. Little is known however on how these variables may relate to attitudes towards FM, and a possible factor underlying the formation of attitudes proposed in this research is individual beliefs about

illness, in particular fear of physical and/or mental illness as expressed in illness/injury sensitivity.

4. Prior Knowledge

From their sample of 3,597 FM patients, Marcus, Richards, Chambers and Bhowmick (2013) found that participants frequently claimed they felt that people who do not have FM would never be able to understand it (p.129) and Cedraschi et al (2012) state that stigmatisation is more attached to conditions, like FM, which lack a clear medical aetiology. For example, a study by Kool and Geenen (2012) found FM participants to report more feelings of isolation than those with other rheumatic disorders. While there has not been a great deal of research on the formation of stigmatisation to FM, parallels may be drawn from research on perceptions of individuals with mental health problems in which past studies have shown that increasing education about mental illness can result in less negative attitudes towards sufferers (Read & Law, 1999). In early research that supports this view, Crawford, Rollins and Sutherland (1961) found that increases in the dissemination of information about mental illness had effected positive changes in participant's attitudes. Similarly, Read and Law (1999) used a series of lectures regarding the psychosocial causes and treatments of mental illness and found participants attitudes to have favourably improved after receiving the information. However contrary findings were revealed in a recent study by Crowe and Averett (2015) on attitudes in mental health professionals, who found that while their training had provided them with more knowledge, many participants did not feel that education had had any effect on their attitudes, and some even claimed that their training had made them more negative in their attitudes as their education had taught them to be more critical in their evaluations (p.58).

In a review of literature regarding methods to reduce stigmatisation towards mental illness and/or minority groups; personal contact with the target group has been found to produce the strongest result in favourable change in attitudes and reducing stigmatisation (Desforges et al, 1991; Couture & Penn, 2003). As feelings of stigmatisation and invalidation persists for individuals with FM (Groopman, 2000; Oldfield, 2013), could prior knowledge, be it through informational interventions or personal contact play a part in changing attitudes towards the disorder, as the indirectly related research on mental illness suggests?

Rationale and Hypotheses

While there is a body of work researching attitudes to various health problems such as mental illness, disability and chronic fatigue syndrome, little is known about attitudes towards fibromyalgia (FM). The present study aims to benefit the literature on FM by exploring attitudes towards the disorder and possible variables that might underlie their formation.

The previous research on health problems has found causal attributions and solution beliefs to be consistent with each other (Ogden & Jubb, 2008); furthermore these beliefs have been shown to relate to attitude formation (Read & Law, 1999; Read & Harré, 2001). The theory of intervention-causation fallacy suggests that people's causal beliefs can be formed from treatment approach and therefore this theory will be applied to FM in a novel study examining whether the presentation of various treatment approaches will result in different attitudes amongst participants. The main aim will therefore be to examine if attitudes to FM are affected by the type of treatment approach recommended to sufferers.

FM is a female-dominated disorder (Carranza-Lira & Villalobos Hernandez, 2014), and as men and women are known to differ in both their experience of and attitudes towards illness (Verbrugge, 1985) an additional aim of this study is to compare attitudes to FM between genders.

The theory of disease-avoidance suggests that humans have evolved a defence mechanism against illness to protect themselves from possible contagion (Park, Faulkner & Schaller, 2003) in this sense, illness sensitivity, is believed to be one of fundamental fears experienced by individuals (Carleton, Park & Asmundson, 2006). As illness sensitivity has been found to relate to the development of chronic pain disorders like FM (Tang et al, 2009) the relationship between illness/injury sensitivity and attitudes to FM will also be explored as a possible underlying factor on attitude formation. Finally, as previous research has found informational interventions and personal contact to be methods of reducing negative attitudes to stigmatised groups (Crawford, Rollins and Sutherland, 1961; Couture & Penn, 2003) this study aims to examine if having prior knowledge of the disorder results in different attitudes to FM.

1. It is hypothesised that attitudes towards fibromyalgia will differ significantly based on the treatment approach (H1).
2. It is hypothesised that there will be a significant difference between genders in their attitude to fibromyalgia (H2).
3. It will also be hypothesised that there will be a significant relationship between levels of illness/injury sensitivity and attitudes to fibromyalgia (H3).

4. It is hypothesised that there will be a significant difference in attitudes to fibromyalgia across individuals who have, or do not have prior knowledge of the disorder (H4).

Method

Participants

Convenience sampling was used to gain access to participants for this research. The population was drawn from undergraduates at a Dublin college, a mix of first, second and third year students took part from both psychology and non-psychology courses. Permission to enter classrooms was gained via emails to a selection of college lecturers. Participation was entirely voluntary and students were informed of the anonymous nature of the study. The sample, consisting of 174 participants, was randomly assigned to three treatment approaches which resulted in; 59 participants in the pain relief medication group, 57 in the psychological approaches group, and 58 in the complementary and alternative medicines group. The sample was predominantly female with 108 women and 59 men taking part; 7 participants did not answer this question and therefore 4% of the samples gender was unknown. 69.5% of the sample were from non-psychological disciplines (N=121) while the remaining 30.5% were psychology students. Age range was not a factor of participation therefore the students taking part were not required to state their age.

Design

This study used a between-subjects quasi-experimental design with a within-subjects correlational element. Pseudo-randomisation occurred as all participants had equal chance of being assigned to either of the three treatment approach groups. This design featured some manipulation as participants were naïve to the fact that there were three different questionnaires, each representing a different treatment approach group, being

handed out. Independent variables (IVs) were treatment approach (pain relief medication, psychological approaches or complementary and alternative medicines) and gender and prior knowledge (with a yes or no response). The dependent variable (DV) was scores on a FM attitudes test. For the within-subjects correlational component of this study, the predictor variable (PV) was scores on the revised illness/injury index and the criterion variable (CV) was scores on the FM attitudes test.

Materials

FM Definition

All participants were given the following definition of FM as part of their questionnaire pack:

Fibromyalgia (FM) is a chronic pain disorder that features a wide array of symptoms including sleep disturbances, chronic fatigue, anxiety, depression, cognitive impairments and widespread pain. The National Fibromyalgia Association estimates between 75-90% of sufferers are women.

The definition was written using information from the previous literature and was purposefully broad and non-judgemental so as to ensure that the recommended treatment be the only information that may affect attitudes towards the disorder.

Recommended Treatments

Following the definition was a brief statement suggesting a treatment that is recommended for FM (see Appendix A). Pain relief medication often recommended by physicians include, antidepressants, muscle relaxants, nonsteroidal analgesics,

benzodiazepine and narcotic analgesics (Krsnich-Shriwise, 1997, p.73) and treatments addressing the psychological component include mindfulness-based cognitive therapy interventions which significantly reduce depressive symptoms and also the impact of FM on participants (Botella et al, 2013; Parra-Delgado & Latorre-Postigo, 2013). Finally, complementary medicine approaches researched in FM literature include physical exercise (Häuser et al, 2010; Lima et al, 2013), various relaxation techniques (Meeus et al, 2015) and acupuncture (Langhorst et al, 2010).

The wide variety of methods in the management of FM was organised by Saperia and Swartzman (2012) into 3 distinct treatment approaches: pain relief medications, psychological approaches and complementary and alternative medicines. Based on this classification, one third of participants received a questionnaire that recommended pain relief medication as treatment, one third psychological approaches and one third complementary and alternative medicines (see Appendix A).

The Chronic Fatigue Syndrome Attitudes Test

In their paper “Chronic Fatigue Syndrome and Fibromyalgia: Clinical Assessment and Treatment” Friedberg and Jason (2001, p 433-434) write that along with a lack of clear aetiology many characteristics of FM overlap with chronic fatigue syndrome (CFS) such as sharing the key symptoms of fatigue, widespread pain and cognitive impairments. Therefore based on shared symptomology and the demographic of sufferers (Friedberg & Jason, 2001), the Chronic Fatigue Syndrome Attitudes Test (Shlaes, Jason & Ferrari, 1999) was deemed an appropriate questionnaire to measure attitudes towards individuals with FM.

The Chronic Fatigue Attitudes Test (see Appendix B) was originally a 19 item questionnaire to fill a gap in the literature as no measurement existed to examine attitudes to the disorder and to sufferers (Shlaes, Jason & Ferrari, 1999, p.445). After test-retest reliability was performed, Shlaes, Jason and Ferrari (1999) found 14 out of the original 19 items to be consistent (p.448) and all but one item to have acceptable internal reliability (p.449) and internal consistency (p.451). In their discussion the authors found the CFS Attitudes Test to have moderate reliability as a measure (Shlaes, Jason & Ferrari, 1999, p.456).

The questionnaire is answered on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale can be further divided into three factors; subscale 1 (items 1-5) measures responsibility for CFS (e.g. people with CFS are just lazy), subscale 2 (items 6-10) measures relevance of CFS (e.g. CFS is not as big a problem as the media suggests) and finally subscale 3 (items 11-14) measures traits of people with CFS (e.g. if people with CFS rest then they will get better) (Shlaes, Jason & Ferrari, 1999, p.450). Reverse coding must be performed on items 7 and 10, and when interpreting totals, the higher the score the more negative the attitude to CFS (Shlaes, Jason & Ferrari, 1999).

The Chronic Fatigue Syndrome Attitudes Test was adapted for the current research by changing the abbreviation “CFS” to “FM” throughout (see Appendix C). Furthermore, in item 7 the expression “federal funds” as used by Shlaes, Jason and Ferrari (1999) (see Appendix B) was changed to “state funds” to be better understood by Irish participants (see Appendix C).

Illness/Injury Sensitivity Index

A second questionnaire used in this study was the Revised Illness/Injury Sensitivity Index (IISI) by Carleton, Park and Asmundson (2006) (see Appendix D). Originally presented as an 11-item self-report questionnaire used to measure fears and the catastrophising of illness by Taylor (1993, as cited by Carleton, Asmundson & Taylor, 2005, p.237), the revised index was found to have more construct validity with the removal of 2 of the questionnaires original items (Carleton, Park, & Asmundson, 2006, p.341). The revised questionnaire is comprised of face-valid items (Carleton, Park, & Asmundson, 2006, p.340) that measure the subscales of fear of illness (e.g. I worry about my physical health) in items 3,4,6,7 & 8 and fear of injury (e.g. the thought of injury terrifies me) in items 1,2,5 & 9 (Carleton, Park, & Asmundson, 2006). Using a 5-point Likert scale ranging from 0 (*agree very little*) to 5 (*agree very much*), total score is used to measure an individual's level of sensitivity to illness and injury (Carleton, Park, & Asmundson, 2006).

While the revised 9 item score was found to have good construct validity, Carleton, Park and Asmundson (2006) note a weakness of the index is that it does not differentiate between long term and short term illnesses or injuries (p.345).

Demographic Questions

Two demographic questions were presented to participants on the last page of their questionnaires pack. These were to report on their gender and whether they had any prior knowledge of FM and were presented as; "Gender: Male _ Female_" and "Before taking part in this study were you aware of fibromyalgia; Yes_ No_".

Full Questionnaire Packs

A questionnaire pack for each treatment approach group was put together consisting of the aforementioned definition of FM and one of the three recommended treatment approaches, followed by the CFS attitudes test as adapted for FM and the revised Illness/Injury Sensitivity Index. The questionnaire pack had a cover letter giving details of the research which explained the anonymous nature of participation (see Appendix E) and a closing page which, as well as offering gratitude to the students, gave contact details for anyone who had any questions about their participation and a web address for an Irish FM support network for additional information on the disorder (see Appendix E).

Procedure

Upon being granted ethical approval, several lecturers from non-psychology and psychology departments from a Dublin college were approached via email to request permission to sample from their lecture classes. The sample was then obtained by attending the classes that had been offered for participation where the researcher explained both the voluntary and anonymous nature of the study, along with estimated time of participation (approximately ten minutes). Questionnaire packs were organised so that when handed out, each successive participant would receive one of the three possible recommended treatments so as to obtain approximately equal numbers per treatment approach group. Once collected, completed questionnaires were kept in a secure file box that only the researcher had access to before inputting the information to the data analysis and statistics program SPSS on a password protected PC and saved on a password protected USB memory stick afterwards.

Results

Descriptive Statistics

Data analysis for both descriptive and inferential statistics was performed using SPSS 21.

Hypothesis 1

The sample consisted of 174 participants divided between the 3 treatment approach groups; pain relief medication group N=59, psychological approach group N=57 and the complementary and alternative medicine group N=58. Comparison across scores on the FM attitudes test is illustrated in Table 1.

Table 1: *Treatment Approach and FM Attitudes Scores*

Treatment Group	Mean Score	Standard Deviation	Minimum	Maximum
Pain Relief Medication	43.8	11.48	23	76
Psychology Approaches	40.7	10.19	21	79
Alternative and Complementary Medicines	41.34	9.32	24	63

Note: *maximum score=98*

Hypothesis 2

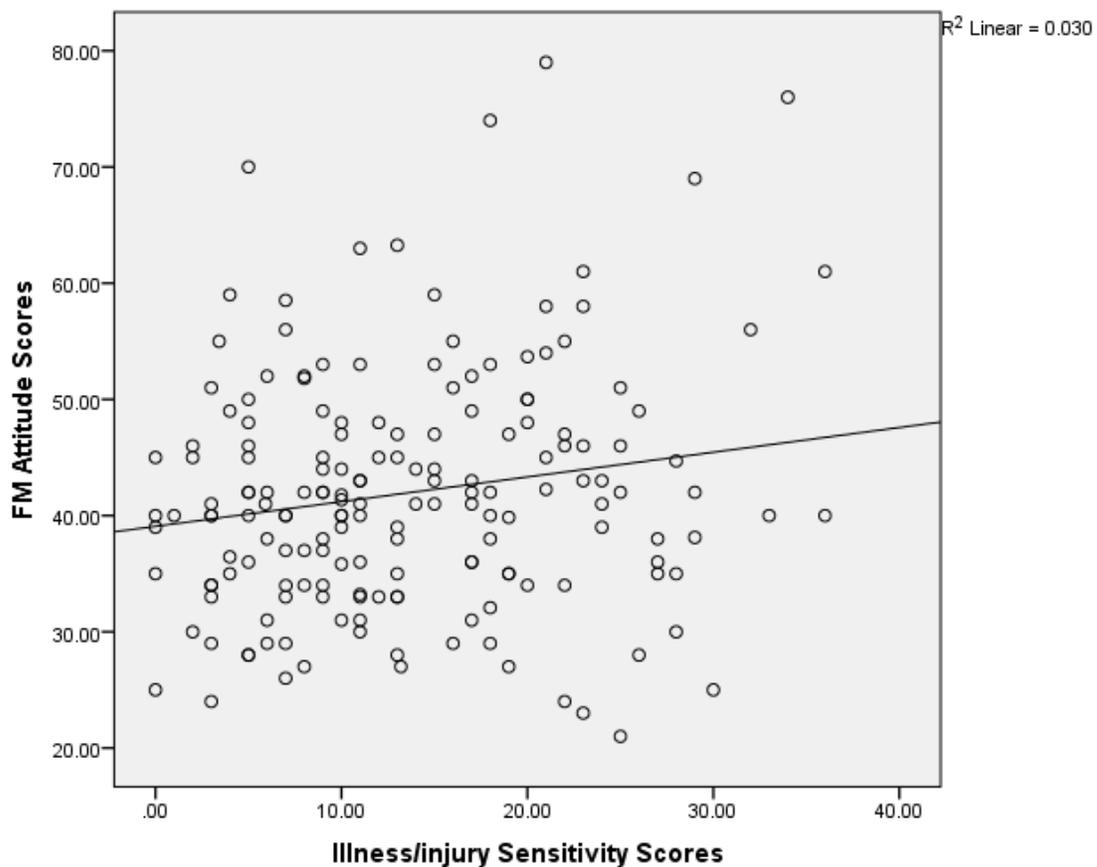
The gender divide in the sample resulted in 108 women (62.1%) and 59 men (33.9%), 7 participants did not report their gender. Statistics for gender results in the FM attitudes tests are illustrated in Table 2 overleaf.

Table 2: *Gender and FM Attitude Scores*

Gender	Mean	Standard Deviation	Minimum	Maximum
Female	39.08	8.25	23	61
Male	45.25	10.54	21	76

Hypothesis 3

A scatterplot was performed to find a weak positive relationship between FM attitude scores (mean=41.96, SD=10.4) and illness/injury sensitivity scores (mean=13.58, SD=8.41), as illustrated in Figure 1.

Figure 1: *Relationship between FM Attitudes and Illness/Injury Sensitivity*

Hypothesis 4

Participants were asked to report whether they had prior knowledge of FM before taking part in this study. 17.8% reported prior knowledge (N=31) while 74.1% reported no prior knowledge of FM. 14 participants did not report on this question. Scores between these groups are illustrated in Table 3.

Table 3: *Prior Knowledge and FM Scores*

Prior Knowledge	Mean	Standard Deviation	Minimum	Maximum
Yes	40.23	12.73	23	76
No	41.36	8.72	21	63

Inferential Statistics

Due to several participants missing single item answers on the questionnaires, an EM algorithm was performed on SPSS 21 which works to estimate and then replace missing values. Cronbach's Alpha was conducted to test for internal consistency and reliability; both scales met the criteria with the FM Attitudes scale at .79 and the Illness/Injury Sensitivity at .91. Assumption checks were then performed to check the variables for normal distribution, homogeneity of variance and outliers.

Hypothesis 1

After performing assumption checks for H1, it was found that the psychological approaches group was not normally distributed showing a significant positive skew. However, due to the other two groups showing normal distribution and the robust nature of the parametric test, a one-way anova was performed. Testing the observed power on SPSS found it to be small at .2. A one-way analysis of variance showed that scores on the FM attitudes test did not differ significantly between the three treatment groups

($F(2,171)=1.45$, $p=.237$). No post hoc tests were performed on results as the null could not be rejected.

Hypothesis 2

Males (mean=45.25, SD=10.54) were found to score higher, and therefore show more negative attitudes to FM than females (mean=39.08, SD=8.25) (see Figure 2). The 95% confidence limits show that the population mean difference of the variables lies somewhere between -9.08 and -3.25. An independent samples t-test found that there was a statistically significant difference between genders in their attitudes to FM ($t(165)=-4.18$, $p<.001$). Therefore the null can be rejected.

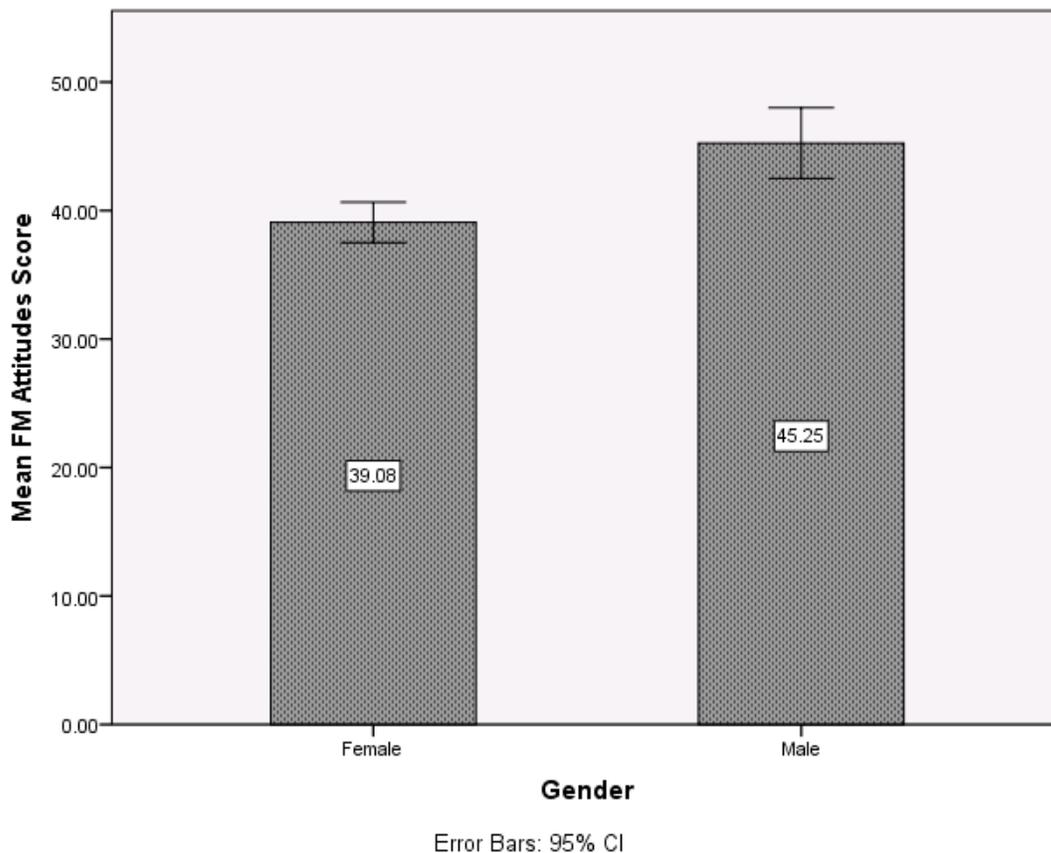


Figure 2: Mean FM Attitudes and Gender

Hypothesis 3

A scatterplot was produced to check assumptions and a small linear relationship was found ($R^2=.03$), it was therefore deemed worthwhile to perform further analysis. The mean scores for FM attitudes was 41.96 (SD=10.4) and for illness/injury sensitivity 13.58 (SD=8.41). A Pearson correlation coefficient found that there was a weak positive significant relationship between scores on FM attitudes and the Illness/Injury Sensitivity index ($r(172)=.17$, $p=.023$), with 2.89% of variance explained. Therefore the null is rejected.

Upon exploration of the significant relationship, it was found to exist between the FM subscale 1 and the illness subscale ($r(172)=.19$, $p=.011$) and injury subscale ($r(172)=.25$, $p=.001$).

Hypothesis 4

As exploration of the data showed the sample of participants with no prior knowledge of FM was not normally distributed, the non-parametric Mann-Whitney U test was performed and revealed that participants with no prior knowledge of FM (mean rank=83.27) and those who did have prior knowledge of FM (mean rank=68.98) did not differ significantly in their attitudes ($z=-1.54$, $p=.123$).

Discussion

Summary of Main Findings

The main aim of this study was to investigate attitudes to FM which had not been found to be widely researched in the previous literature. Formation of attitudes were explored with four possible affecting factors; treatment approach, gender difference, illness sensitivity and prior knowledge. From a convenience sample of 174 undergraduate college students, attitudes were not found to differ significantly across treatment approaches or between participants with prior knowledge of the disorder. However a statistically significant difference was found in attitudes between genders, with males reporting more negative attitudes than women; and a weak positive correlation was found between illness/injury sensitivity and attitudes to FM. Therefore H2 and H2 were supported, and for H1 and H4, the null could not be rejected.

Interpretation of Findings

Hypothesis 1

No statistical difference between treatment approach groups suggests that the manipulation did not have a significant effect on attitudes to FM. Only small mean differences between scores across the three treatment groups implies that recommended treatment alone may not be a strong enough variable to change attitudes to illness. However the pain relief medication groups scoring slightly higher, i.e. reporting more negative attitudes, than the other two approach groups might be explained by the findings of Read and Law (1999) and Read and Harré (2001) who, when researching mental health, found that causal beliefs based upon the biomedical model of illness resulted in

more negative attitudes than when participants were presented with causes based in a psychosocial model. This finding however goes against the body of literature on the experience of chronic pain sufferers who feel that psychological and emotional explanations of their symptoms suggest an invalidation of their pain (Showalter, 1998, p.117; May, Rose & Johnstone, 2000; Dickson, Knussen and Flowers, 2007). As the majority of research on causal beliefs and attitudes in the literature have focused on mental illness and/or other indirectly related conditions, it is possible that intervention-causation fallacy was not generalisable to a disorder like FM. This reflects the research conducted by Ogden and Jubb (2008) who found that causal and treatment beliefs are specific to the type of illness presented to participants (p.13). The highest mean score for questions on the FM attitudes test was found for item 13, "FM is primarily a psychological disorder", which suggests that participants in all three groups regarded FM as a psychologically-based disorder regardless of which treatment approach they were presented with.

Hypothesis 2

Support was found for the hypothesis that there would be a difference in attitudes between genders, with men scoring higher than women, meaning male participants had significantly more negative attitudes than female participants. This reflects findings in the literature on mental health, that women traditionally have more positive attitudes than men (Hampton & Sharp, 2014), with Verbrugge (1985) writing that the most striking difference between genders are those relating to health beliefs and behaviours. One interpretation of this finding is that it supports the view that women are shaped by psychosocial and cultural factors to be more empathetic towards the feelings of others

(Schacter, Gilbert & Wegner, 2012); another interpretation is that as the definition presented to participants stated the statistics revealing the high dominance of female sufferers of FM (Oldfield, 2013; Carranza-Lira and Villalobos Hernandez, 2014), perhaps feeling less vulnerable to the disorder resulted in less sympathetic attitudes from the male participants. However further research would need to be conducted to better understand the possible causes of the significant difference between genders found to exist in their attitudes towards FM.

Hypothesis 3

As hypothesised, a relationship was found between scores on the illness/injury sensitivity index and the FM attitudes test. Though the relationship was weak, it revealed a positive increase between participants in their scores on the two scales; as higher scores on the FM attitudes test equal more negative responses, this relationship suggests that the more anxious participants were about physical and mental health the more negative they were in their attitudes to FM. As illness/injury sensitivity is said to represent a person's fear of illness and injury (Thibodeau et al, 2013), this relationship might be interpreted as a fearful negative response to a disorder like FM, which was presented to participants as being comprised of both physical and mental components.

Although it should be noted that the significance was found to exist only between high scores on the illness/injury subscales and the FM subscale 1 which measures "responsibility for FM" (Shlaes, Jason & Ferrari, 1999). Assessment of responsibility for FM was represented by items that suggested people with FM to be depressed, lazy or to blame for getting sick (Shlaes, Jason & Ferrari, 1999), therefore an interpretation of the

relationship found within the data is that the more fearful participants were of illness/injury, the more they placed responsibility for FM on the sufferers themselves.

As participants appeared to view FM as a psychological disorder in all three treatment approach groups, this finding reflects Sontag (1989, as cited by Shlaes, Jason & Ferrari, 1999) who stated that the more symptoms are believed to be due to psychological causes, the more responsibility is placed on the patient to treat themselves. An interpretation of this relationship could be derived from the work of Brickman et al (1982) who theorised that the attribution of responsibility for a problem can be subdivided into two issues, that of blame and control (p.369). By assigning the responsibility to an individual for their own problem, the sufferer is also made responsible for finding their own solution (Brickman et al, 1982, p.369).

It could be speculated that by placing responsibility of FM onto the sufferers themselves, participants with high levels of illness/injury sensitivity are able to avoid any involvement with the disorder, a view which is supported by the theory of disease-avoidance (Park, Faulkner & Schaller, 2003), as fear of illness may be particularly heightened when encountering a misunderstood condition like FM that could pose an unknown threat to non-sufferers.

Hypothesis 4

The hypothesis that prior knowledge would be a factor in attitudes could not be supported in this study, despite findings from other research that information and contact with people with health issues or from stigmatised groups increases positive attitudes (Crawford, Rollins and Sutherland, 1961; Desforges et al, 1991; Read and Law, 1999; Couture and Penn, 2003). This may be due to the sample not being normally distributed

with only 17.8% of participants reporting prior knowledge and 14 out of the 174 participants leaving the question blank. A further limitation found in this study's methodology, is that participants were simply asked to tick yes or no on the prior knowledge question, therefore the study did not offer differentiated degrees of knowledge, for example between having a passing awareness of FM (e.g. having once heard of it) and having a deeper understanding of it (e.g. having personal experience of it) which impairs the ability to interpret the data.

Strengths and Weakness

A strength of this study is that it applied the novel concept of intervention-causation fallacy to research on FM. Furthermore, studying attitudes towards the disorder may be beneficial in reducing the stigmatisation felt by sufferers through the application of better understanding and appropriate interventions.

By presenting questionnaires with definitions of FM that were identical in all aspects of information except treatment approach, the study's design controlled for treatment being the only influencing factor between groups of participants. However a weakness in the questionnaire study design is highlighted by Söder (1990) who writes that the questions are built on the assumption that a single characteristic can be strong enough to have participants attitudes be measurable on that piece of information alone (p.229).

There were several weaknesses inherent in the sample used for this study. Along with the small observed power, the gender divide was not equal with a predominantly female pool of participants. Few participants had any prior knowledge of FM, which given its prevalence, was surprisingly low. It could be speculated that this was due to the sample

being comprised of undergraduate students, whereas an older population may have reported more contact with or knowledge of the disorder.

A further limitation in the methodology of this study was that the researcher was presented in the cover letter, and by lecturers, as being a psychology student; this may have skewed attitudes toward the psychological approach by the assumption that FM was being studied as such. This could be rectified in future studies by the researcher obscuring their exact field of study.

As a recommendation for future studies, more detail regarding treatment could be presented, and in such a way as to better emphasise the different approaches. For example this information could appear earlier in the FM definition in an attempt to control for the potential problem of participants skim-reading the information and missing the studies element of manipulation.

Finally, as a point of discussion for future research, perhaps the veracity of negative attitudes to FM sufferers should be better explored. In particular, to pose the question of whether the experience of stigmatisation felt by FM sufferers may be a false perception of how others view them and not evidence of strong attitudes towards the condition in the general population.

Conclusion

Despite diagnosis of FM increasing (Sarno, 2014) confusion still exists regarding its aetiology and cure with its combination of emotional, physical and psychological components further clouding understanding (Hayes et al, 2010). While there is a body of work on indirectly related issues such as mental illness and chronic fatigue syndrome, research on FM remains lacking in the areas of attitudes and gender difference. This

study has aimed to fill a gap in the literature by measuring attitudes to FM with an examination of factors which may play a role in attitude formation such as treatment approach, gender, illness sensitivity and prior knowledge. As the stigmatisation attached to contested disorders adds to the suffering of the patients (Groopman, 2000; Oldfield, 2013), the field of psychology may be able to play a helping role by researching why such stigmatisation exists and through the design of interventions to improve understanding and attitudes.

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Appendix A

Three Versions of Treatment Approaches

For pain relief medication group:

Fibromyalgia (FM) is a chronic pain disorder that features a wide array of symptoms including sleep disturbances, chronic fatigue, anxiety, depression, cognitive impairments and widespread pain. The National Fibromyalgia Association estimates between 75-90% of sufferers are women. Recommended treatment can include narcotic pain killing tablets.

For psychological approaches group:

Fibromyalgia (FM) is a chronic pain disorder that features a wide array of symptoms including sleep disturbances, chronic fatigue, anxiety, depression, cognitive impairments and widespread pain. The National Fibromyalgia Association estimates between 75-90% of sufferers are women. Recommended treatment can include stress reduction techniques, psychological counselling and/or psychotherapy.

For complementary and alternative medicines group:

Fibromyalgia (FM) is a chronic pain disorder that features a wide array of symptoms including sleep disturbances, chronic fatigue, anxiety, depression, cognitive impairments and widespread pain. The National Fibromyalgia Association estimates between 75-90% of sufferers are women. Recommended treatment can include massage, acupuncture and/or herbal teas.

Appendix B

Original Chronic Fatigue Attitudes Test (Shlaes, Jason & Ferrari, 1999, p.450)

1. People with CFS are just depressed.
2. People with CFS are lazy.
3. I would not sit on the same toilet that a person with CFS had just used.
4. People with CFS are to blame for getting sick
5. CFS is a form of punishment from God.
6. Employers should be permitted to fire those with CFS
7. More federal funds should be allocated for research on CFS.
8. CFS is not a real medical illness.
9. CFS is not as big a problem as the media suggests
10. CFS is one of the leading medical problems in the country.
11. The majority of people with CFS were competitive, driven to achieve, and compulsive before they got sick.
12. People with CFS would get better if they really wanted to be healthy.
13. CFS is primarily a psychological disorder.
14. If people with CFS rest then they will get better.

Coding System (Shlaes, Jason & Ferrari, 1999, p450)

Factor 1: Responsibility for CFS, Q 1-5

Factor 2: Relevance of CFS, Q 6-10

Factor 3: Traits of people with CFS, Q 10-14

Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Reverse items 7 and 10.

Appendix C

Chronic Fatigue Attitudes Test (Shlaes, Jason & Ferrari, 1999, p.450) as adapted for Fibromyalgia (FM)

1. People with FM are just depressed
2. People with FM are just lazy
3. I would not sit on the same toilet that a person with FM had just used
4. People with FM are to blame for getting sick
5. FM is a form of punishment from God
6. Employers should be permitted to fire those with FM
7. More state funds should be allocated for research on FM
8. FM is not a real illness
9. FM is not as big a problem as the media suggests
10. FM is one of the leading medical problems in the country
11. The majority of people with FM were competitive, driven to succeed and compulsive before they got sick
12. People with FM would get better if they really wanted to be healthy
13. FM is primarily a psychological disorder
14. If people with FM rest then they will get better

Coding System (Shlaes, Jason & Ferrari, 1999) as adapted for FM

Factor 1: Responsibility for FM, Q 1-5

Factor 2: Relevance of FM, Q 6-10

Factor 3: Traits of people with FM, Q 10-14

Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Reverse items 7 and 10.

Appendix D

Illness/Injury Sensitivity Index-Revised (Carleton, Park, & Asmundson, 2006)

	Agree very little	Agree a little	Somewhat agree	Agree a lot	Agree very much
1. I am frightened of being injured.	0	1	2	3	4
2. The thought of injury terrifies me.	0	1	2	3	4
3. I worry about becoming physically ill.	0	1	2	3	4
4. The thought of physical illness scares me.	0	1	2	3	4
5. I worry about being injured.	0	1	2	3	4
6. I worry that I might get a serious physical illness in the future.	0	1	2	3	4
7. I worry about my physical health.	0	1	2	3	4
8. I get scared if I think I am coming down with an illness.	0	1	2	3	4
9. I can't stand the thought of being injured.	0	1	2	3	4

Coding System (Carleton, Park, & Asmundson, 2006)

Fear of Illness Subscale: items 3,4,6,7,8

Fear of Injury Subscale: items 1,2,5,9

Total score is used. No reverse coding.

Appendix E

Questionnaire Pack: Cover Letter

To whom it may concern,

My name is Gemma Reeves and I am a final year full time psychology student. I am writing a research project investigating a disorder called Fibromyalgia and perceptions of pain. If you could please find time to take part in this study your data will be a part of my undergraduate thesis and your participation would be greatly appreciated.

Please read the short definition overleaf and then answer the two questionnaires that follow. This should not take more than ten minutes.

Your answers will be completely anonymous and no names or student numbers will be required.

With Thanks,

Gemma Reeves

Questionnaire Pack: Take Home Sheet

Please visit www.fibroireland.com if you wish to seek more information about Fibromyalgia or require contact details for local support groups.

If you have any questions about the nature of this study please feel free to contact me at xxxxxx@mydbs.ie

Thank you for your participation.

