



BSc in Psychology

Health Anxiety Symptoms among Icelandic Fibromyalgia Patients and their impact on Quality of Life

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Foreword

Submitted in partial fulfillment of the requirements of the BSc psychology degree, Reykjavík University, this thesis is presented in the style of an article for submission to a peer-reviewed journal.

Abstract

The prevalence of health anxiety is unknown in Iceland, but studies have indicated that the condition is relatively common in secondary healthcare in other countries. This pilot study was conducted to examine the prevalence of health anxiety among Icelandic fibromyalgia patients seeking service at Þraut, center of fibromyalgia and related conditions in Iceland. This is a data based study that used medical records from 92 individuals. The sample contains 86 females (93.5%) and 6 males (6.5%), ranging in age from 18 to 73 years old, with the mean age of 42.73 ($SD = 12.13$). The Short Health Anxiety Inventory (SHAI) was used to screen for health anxiety. High level of health anxiety was found in 44.9% of the individuals. Other findings from the study were that fibromyalgia patients that were screened with high level of health anxiety reported more severe fibromyalgia symptoms, lower quality of life and more fatigue. Also, higher percentage of FM patients with high health anxiety met criteria for psychiatric disorders compared to those with lower level of health anxiety.

Keywords: health anxiety, hypochondriasis, fibromyalgia, quality of life.

Útdráttur

Tíðni heilsukvíða á Íslandi er óþekkt, en erlendar rannsóknir hafa sýnt fram á að kvillinn sé tiltölulega algengur á heilsugæslustöðvum og sérfræðiklínikum. Þessi grunnrannsókn var gerð til þess að kanna tíðni heilsukvíða á meðal íslenskra vefjagigtarsjúklinga sem sækja sér þjónustu hjá Þraut, miðstöð vefjagigtar og tengdra sjúkdóma á Íslandi. Rannsóknin notaðist við upplýsingar úr sjúkraskrá þrautar frá 92 einstaklingum. Úrtakið innihélt 86 konur (93,5%) og 6 karla (6,5%) þar sem aldursbilið var frá 18 til 73 ára. Meðalaldur úrtaksins var 42,73 ($SD = 12,13$). The Short Health Anxiety Inventory (SHAI) listinn var notaður til þess að skima fyrir heilsukvíða. Hár heilsukvíði fannst á meðal 44,9% einstaklinganna. Aðrar niðurstöður voru að þeir vefjagigtarsjúklingar sem skimuðust með háan heilsukvíða greindu einnig frá alvarlegri einkennum vefjagigtar, þeir skorðu lægra á skala sem metur lífsgæði og greindu frá meiri þreytu. Eining mættu fleiri einstaklingar mað háan heilsukvíða greiningarskilmerkjum fyrir aðrar geðraskanir miðað við þá sem skimuðust með lágan heilsukvíða.

Lykilorð: heilsukvíði, vefjagigt, lífsgæði.

Health Anxiety Symptoms among Icelandic Fibromyalgia Patients and their impact on Quality of Life.

Fibromyalgia (FM) is a disorder characterized by chronic widespread musculoskeletal pain, stiffness and tenderness in muscles and joints when no inflammation is present in the body (Hawkins, 2013). Other common symptoms among FM patients are chronic fatigue, sleep disturbance, increased sensitivity to pain, morning stiffness, mood disturbance and cognitive dysfunction (Wolfe, Ross, Anderson, Russell, & Hebert, 1995; Arnold et al., 2012; Hawkins, 2013). The fact that inflammation and abnormalities in the muscles were generally not present among individuals suffering from the disorder led to changes on the term fibrositis, to the term used today, fibromyalgia (F. Wolfe et al., 1990; Simms et al., 1994; Smith, Harris, & Clauw, 2011; Hawkins, 2013).

The American College of Rheumatology (ACR) issued diagnostic criteria for fibromyalgia in 1990 consisting of widespread musculoskeletal pain of at least three months duration and tenderness in at least 11 of 18 specific tender point sites in the body (F. Wolfe et al., 1990). These ACR1990 criteria have been criticized for not being sensitive to change in the condition of fibromyalgia as some patients who had well documented fibromyalgia at one point did not fulfill the criteria at a later stage. Also, the ACR1990 criteria require that a health care professional performs a tender point examination, decreasing the applicability of these criteria for epidemiological research. Therefore, a different set of diagnostic criteria were issued in 2010 which, in addition to documenting widespread pain, put emphasis on other core symptoms, such as fatigue, non-enduring sleep and cognitive dysfunction (Frederick Wolfe et al., 2010). These ACR2010 criteria were further modified in 2011 for optimizing its use in clinical and epidemiologic researches (F. Wolfe et al., 2011). The prevalence of FM varies, depending on the criteria that is used to diagnose the disorder (Jones et al., 2015). Prevalence has varied from 0.75% - 20% over the years (Adams & Sim,

1998). Recent studies have indicated that FM is a rather common condition in the general population in Europe, varying from 1.4% in France to 3.7% in Italy (Branco et al., 2010; Frederick Wolfe, Brähler, Hinz, & Häuser, 2013). FM is also a well-known disorder and more common in secondary clinics compared to the general population. Studies have indicated that the prevalence for FM in secondary clinics for rheumatic diseases is around 15% (Alarcón-Segovia, Ramos-Niembro, & González-Amaro, 1983; Marder et al., 1991).

The causes of FM is not fully understood, but dysfunctions in the central nervous system seem to have an impact on the development of FM (Adams & Sim, 1998). It has been indicated that mental health problems are more common with FM patients compared with the general population, whereas major depression has been found in 22% of FM patients and a link between anxiety and FM has also been found (Hoffman & Dukes, 2007; Aguglia, Salvi, Maina, Rossetto, & Aguglia, 2011; Fuller-Thomson, Nimigon-Young, & Brennenstuhl, 2012). FM patients often feel socially isolated and their ability to engage in daily activities is often limited, which impacts their daily life substantially (Arnold et al., 2008; Martín et al., 2016). FM symptoms often lead to high levels of disability and functional impairment. Therefore, unemployment, sick leave, retirement and carrier interruptions among FM patients is common and results in lower quality of life and significant societal burden (Annemans, Le Lay, & Taïeb, 2009).

The main goals of treatment in FM is to reduce the impact of pain and improve sleep, and also to improve physical function (Bellato et al., 2012). A multifaceted treatment for FM is most preferred, with the use of medicines and controlling pain symptoms without medications with physical exercise. Cognitive behavior therapy (CBT) is also an effective approach, and has been shown to have the greatest benefit if used together with physical exercise (Mengshoel, Forseth, Haugen, Walle-Hansen, & Førre, 1995; Gowans, deHueck,

Voss, & Richardson, 1999; Mannerkorpi, Nyberg, Ahlmén, & Ekdahl, 2000; Goldenberg, 2004; Bellato et al., 2012).

Health anxiety refers to excessive concerns about one's health. Individuals with health anxiety fear they have, or that they might get a serious disease. Individuals with health anxiety are, in some cases, confident that they have an organic disease although medical examinations indicate no such thing and they doubt the evaluation on good health given by healthcare professionals (Avia & Ruiz, 2005; Olatunji, Etzel, Tomarken, Ciesielski, & Deacon, 2011). A minor bodily change in sensation may trigger the believe that a serious condition is present. Physical changes like swelling and redness in the skin are an example of such triggers (Olatunji et al., 2011; Rachman, 2012). Chronic pain has been shown to be associated with health anxiety, whereas high level of health anxiety was found in 59% of such patients. Chronic pain is also an example of what might trigger the condition (Rachman, 2012).

Health anxiety perpetuates because individuals interpret harmless external and internal conditions in a catastrophic way (Bouman, 2014). The contemporary cognitive-behavioral conception of health anxiety is that the disorder arises from situations that are interpreted as threatening, that provoke inadequate and inappropriate health-related assumptions and believes. These believes are commonly triggered by vague and questionable bodily sensations or by difficult situations, such as illness and death. Assessing bodily sensation in this way leads to anxiety and other adverse feelings, which along with safety behavior, such as avoidance, asking for reassurance and checking, maintains these assumptions and believes (Bouman, 2014).

Health anxiety is a term used to describe a disorder known as "hypochondriasis", which was eliminated from the DSM-V criteria. Two disorders were introduced in DSM-V to replace hypochondriasis; somatic symptom disorder (SSD) and illness anxiety disorder

(IAD). What distinguishes between these two disorders is that troublesome somatic symptoms are present in SSD but not in IAD. Of those individuals that meet criteria for hypochondriasis, 75% would receive diagnosis for SSD and 25% for IAD. (Starcevic, 2014). The prevalence of health anxiety is relatively common and has been found in 5.7% of the general population in Australia (Sunderland, Newby, & Andrews, 2013) and in 11 to 19.9% of secondary health care patients in the U.K. (H. Seivewright, Salkovskis, Green, & Mullan, 2004; P. Tyrer, Cooper, Crawford, et al., 2011).

Health anxiety patients are up to six times more likely to have one or more mental or physical health problems, wherein bipolar, agoraphobia, panic disorder and generalized anxiety disorder are among those mental health problems (Sunderland et al., 2013). Individuals living with a disease that has unpredictable symptoms often experience depression and anxiety (Arnett, Barwick, & Beeney, 2008; Garfield & Lincoln, 2012). It has been demonstrated that living with a disease of that sort, along with experiencing mental health problems, may result in lower quality of life (Arnett et al., 2008). A study from 2016 suggested that patients living with long-term illness and who experience health anxiety, report lower quality of life (Hayter, Salkovskis, Silber, & Morris, 2016). This indicates that health anxiety affects mental and emotional health in patients with disorders that have unpredictable symptoms, as is recognized among FM patients (Arnold et al., 2008). In fact a Turkish study demonstrated that FM patients had higher scores on the health anxiety inventory short form (SHAI) scale compared to a control group (Ucar et al., 2015).

CBT is the most commonly researched treatment of health anxiety treatments (P. Tyrer, Cooper, Tyrer, et al., 2011; P. Tyrer et al., 2014; H. Tyrer et al., 2015) and it has been indicated that CBT is an effective way to treat health anxiety both in primary (Barsky & Ahern, 2004; Clark et al., 1998; P. Tyrer, Cooper, Tyrer, et al., 2011) and secondary care (Helen Seivewright et al., 2008; P. Tyrer et al., 2014).

Based on conclusions from previous studies, health anxiety may influence and maintain certain FM symptoms, such as depression and anxiety and presumably lowers FM patients quality of life (Sunderland et al., 2013; Hayter et al., 2016). Thus, implementing health anxiety treatments into programs for FM patients may decrease depressive and anxious symptoms and increase quality of life among them. That might result in a positive outcome for the patients and the society in whole. Therefore, the main purpose of the current study is to examine if health anxiety is common among fibromyalgia patients. Further, it is hypothesized that health anxiety 1) increases the severity of fibromyalgia symptoms and 2) decreases quality of life, 3) that mental health problems are more common among individuals with health anxiety and that health anxiety 4) negatively effects working status and 5) increases fatigue.

Method

Study Sample

Information was gathered from medical records of patients that underwent a fibromyalgia diagnosis at Praut, center of fibromyalgia and related conditions in Iceland between December 2016 and April 2017. The sample consisted of 92 individuals, with 86 females (93.5%) and 6 males (6.5%), ranging in age from 18 to 73 years old, with the mean age of 42.73 ($SD = 12.13$). Three individuals were not included as they had missing data ($n = 3$).

Instruments and Measures

Individuals that undergo a fibromyalgia diagnosis at Praut, answer several questionnaires in the analytical process. Five of those questionnaires, that measure health anxiety, fibromyalgia symptom severity, quality of life and fatigue were used, along with psychiatric disorder diagnosis from the MINI psychiatric interview. Demographic characteristics, such as age, gender and work status, were also assessed through a self-report questionnaire. The question regarding work status was on a 11-point scale where individuals

marked an X in one box. Answer options were; 1) employed, 2) working at home, 3) at school, 4) unemployed, 5) 50-74% disabled, 6) 75% disabled, 7) retired, 8) on a sick leave, 9) sickness allowance, 10) rehabilitation allowance and 11) freelance. Those who marked answer options one, two, three, four, seven or eleven were classified as active worker. Those who marked answer options five, six, eight, nine or ten were classified as inactive worker. These two variables were used to evaluate work status.

The Short Health Anxiety Inventory (SHAI) is a shortened version of the Health Anxiety Inventory scale (HAI; 64 items) by Salkovskis et al. (2002). The scale measures health anxiety and consists of 18 items, where 14 items are taken from the HAI scale. Four other items are included in the short form that measure how individuals perceive negative effects from getting ill. All items consist of four statements, whereas individuals select a statement that best describes their feelings for each item over the past six months. An example of a statement is *"I spend most of my time worrying about my health"*. Both the 14-item and the 18-item form of the SHAI are usable to screen for health anxiety symptoms. Studies have shown that HAI is a reliable measuring instrument for health anxiety and its validity is good. The short version of the list also correlates highly with the longer version (Salkovskis et al., 2002; Alberts, Hadjistavropoulos, Jones, & Sharpe, 2013). The SHAI was translated to Icelandic in 2014 by Pétur Tyrfingsson, Helgi Héðinsson and Inga Hrefna Jónsdóttir. It has been shown that the Icelandic version has high test-retest reliability in a community sample and its internal consistency is good for both clinical and community samples (Viðarsson, 2016). The 14-item form of the SHAI ranges from 0 to 42, whereby higher scores indicate greater health anxiety, and to get a diagnosis of health anxiety, a cut-off point 18 on the SHAI is required. Rode, Salkovskis, Dowd and Hanna (2006) disclosed that a discriminant analysis on the SHAI revealed that a cut-off point of 18 reliably and solely identified individuals that met the DSM-IV criteria for hypochondriasis and that individuals

that scored 15 to 17 on the SHAI were a blend of hypochondriacal patients and individuals suffering from very high levels of health anxiety that just missed the criteria for a diagnosis. A cut-off point of 15 was the main focus in the present study, like Rode et al. (2006) did in their research, where they examined health anxiety levels in chronic pain clinic attenders, whom have similar symptoms as the patient group examined in the present study. A cut-off point of 18 is also remotely reported in the present study.

The Fibromyalgia Impact Questionnaire (FIQ) is a self-report questionnaire of ten items that measures the total spectrum of problems linked to FM. The questionnaire covers three domains; function, overall impact and symptoms. The first question includes nine items that cover function. Individuals mark their ability to do every-day things, such as driving a car and prepare a meal, on a four-point scale from 0 = (always) to 3 = (never). Individuals can mark a fifth point that refers to 4 = (does not apply). The second and the third questions refer to over-all impact where individuals answer how many days they felt good and how many days they were incapable to work for the past week. Questions four to ten refer to symptoms that are linked to fibromyalgia like pain, stiffness, problems with work, fatigue and anxiety. Individuals mark on a ten-point scale how much each symptom affects them. Items of the list measure fibromyalgia severity. FIQ has been shown to be a reliable and a valid measure of fibromyalgia severity (C. S. Burckhardt, Clark, & Bennett, 1991; Bennett, 2005).

The Quality of Life Scale (QOLS) was initially a 15-item scale that measured five factors regarding quality of life. The five factors were 1) material and physical well-being, 2) relationships with other people, 3) social, community and civic activities, 4) personal development and fulfillment and 5) recreation. The list was later expanded, currently containing 16 items. The added item relates to independence, the ability to care for yourself. It has been shown that the list is a valid instrument to measure quality of life. The total score

on the list can range from 16 to 112, where higher scores indicate higher quality of life (Carol S Burckhardt and Anderson, 2003). The list was translated to Icelandic by Andri S.

Björnsson, who combined two separate translations by Auður Sjöfn Þórisdóttir and Pétur Tyrfingsson. The Icelandic version has adequate psychometric properties and its convergent validity is good. It has also been shown that its reliability is good in a community sample and acceptable in a clinical sample. (Jónsdóttir & Sigurðardóttir, 2016).

Mini International Neuropsychiatric Inventory (MINI) is a standardised psychiatric interview that assesses 17 mental disorders; major depressive episode, major depressive episode with melancholic features, dysthymia, suicidality, manic and hypomanic episodes, panic disorder, agoraphobia, social phobia, obsessive and compulsive disorder (OCD), post-traumatic stress disorder (PTSD), alcohol dependence and abuse, substance dependence and abuse, psychotic disorders, anorexia nervosa, bulimia nervosa, generalized anxiety disorder and antisocial personality disorder. It has been shown that MINI has a good test-retest reliability and a good validity (Lecrubier et al., 1997). In 2004, Pétur Tyrfingsson translated the interview into Icelandic, and it has been shown that its validity is good (Sigurðsson, 2008). Of those 17 disorders, major depression, panic disorder, social phobia, OCD and general anxiety were computed into one variable that was used to evaluate the prevalence of psychotic disorder among FM patients.

The Multidimensional Fatigue Inventory (MFI) is a 20-item self-report scale that measures fatigue. Fatigue is measured from five dimensions; general fatigue, physical fatigue, mental fatigue, reduced motivation and reduced activity. Individuals mark an X in one of five boxes where answer options range from 1 = (yes, that is true) to 5 = (no, that is not true). An example of a statement is: “*Physically I feel only able to do a little*”. It has been shown that internal consistency is good and the list has a good construct validity (Smets,

Garssen, Bonke, & De Haes, 1995). The list was translated to Icelandic by Eggert S. Birgisson.

Procedure

In collaboration with Þraut, centre of fibromyalgia and related conditions, data from medical records of all individuals that came in for a fibromyalgia diagnosis between December 2016 and April 2017 were analysed. All individuals who seek service at Þraut answer 18 self-report scales that screen for physical, mental and social symptoms. They can either answer the scales at Þraut or get them sent by an e-mail. Afterwards, all individuals come in for an interview where the scales are evaluated by professional employees of Þraut. A second interview then takes place where a diagnosis of fibromyalgia is given if relevant. Subsequently, those diagnosed with fibromyalgia, receive support from Þraut on what is recommended to do next, some individuals initiate physical therapy while others seek psychological support.

After a licence for the study was granted from the National Bioethics Committee, a copy of the data, whereas personally identifiable information had been eliminated, was provided to the researcher and the analytical process begun.

Design and Data Analysis

The present study is a pilot study, using a convenience sample. To analyse the data, the statistical program SPSS was used. First, descriptive statistics were calculated to provide information about FIQ, QOLS, MINI and working status, depending on the SHAI. Second, four independent *t*-tests were employed to evaluate if there was a mean difference between health anxiety groups on the dependent variables (FIQ, QOLS, MINI and working status). Third, a multivariate analysis of variance (MANOVA) was used to determine if there was a difference between health anxiety groups on five dimensions of fatigue.

When the data was examined for missing values, it became clear that three individuals had not answered two or more questions on the SHAI, and were therefore excluded from the data.

Results

The frequencies of health anxiety with the cut-off point 15 were computed for all patients. Due to missing data on the SHAI, the final sample consisted of 89 patients. Almost half of them scored over 15 on the SHAI, or 40 patients (44.9%), indicating that they have high levels of health anxiety. The remaining 49 patients (55.1%) scored between 0 to 14 on the SHAI. The frequencies of health anxiety with the cut-off point 18 were also computed for all patients, where 20 patients (22.5%) scored over 18 on the SHAI. That suggests that 22.5% of the patients presumably meet diagnosis criteria for health anxiety. The total number of patients, range (minimum and maximum available scores), mean and standard deviation for FIQ and QOLS depending on health anxiety groups (cut-off point 15) and the total scores are displayed in table 1.

Table 1

Descriptive Statistics for FIQ and QOLS

	High health anxiety		Low health anxiety		Total	
	FIQ	QOLS	FIQ	QOLS	FIQ	QOLS
Range	30-92	44-99	23-84	51-105	23-92	44-10
<i>M</i>	63.53	70.80	57.02	79.59	60.21	75.91
<i>SD</i>	12.83	13.37	13.33	12.36	13.36	13.36
n/N	40	40	49	49	92	92

Of those patients in the higher health anxiety group, 47% met criteria for other psychiatric disorders ($M = .47$, $SD = .51$) and 27% of the patients in the low health anxiety

group ($M = .27$, $SD = .45$). Active workers (individuals who had jobs or attended school) were found in 50% ($M = .50$, $SD = .51$) of the higher health anxiety group but in 69% ($M = .69$, $SD = .47$) of the lower health anxiety group.

The total number of patients, mean and standard deviation for all five fatigue dimensions on the MFI and the total scores are displayed in table 2.

Table 2

Descriptive Statistics for the Multiple Fatigue Inventory

MFI measure	High health anxiety			Low health anxiety			Total		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	N
General fatigue	18.18	2.16	40	17.92	2.37	49	17.99	2.30	92
Mental fatigue	14.50	3.44	40	12.82	3.73	49	13.57	3.64	92
Physical fatigue	17.35	2.81	40	15.31	3.66	49	16.26	3.43	92
Reduced motivation	10.78	3.62	40	9.43	2.61	49	10.01	3.14	92
Reduced activity	14.58	3.62	40	13.33	3.45	49	13.87	3.60	92

FIQ

An independent *t*-test was conducted to examine whether there was a significant mean difference between the health anxiety groups regarding FM symptom severity. Results from the independent *t*-test demonstrated, that on average, patients in the high health anxiety group scored higher on the FIQ ($M = 63.53$, $SD = 12.83$), than patients in the low health anxiety group ($M = 57.02$, $SD = 13.33$). This difference, 6.51, BCa 95% CI [- 12.056, -0.953], was significant $t(87) = -2.33$, $p = .022$, with a medium-sized effect, $r = 0.24$.

QOLS

An independent *t*-test was conducted to examine whether there was a significant mean difference between the health anxiety groups and their quality of life. Results from the

independent *t*-test showed, that on average, patients in the high health anxiety group scored lower on the QOLS ($M = 70.80$, $SD = 2.11$), than patients in the low anxiety group ($M = 79.59$, $SD = 12.36$). This difference, 8.79 BCa 95% CI [3.359, 14.224], was significant, $t(87) = 3.22$, with a medium-sized effect, $r = 0.33$.

MINI

To examine if there was a significant mean difference between the health anxiety groups and if they met criteria for psychiatric disorders, an independent *t*-test was conducted. Results from the independent *t*-test showed that 47% of patients in the high health anxiety group met criteria for psychiatric disorder ($M = .47$, $SD = .51$), and 27% of patients in the low health anxiety group met criteria for psychiatric disorder ($M = .27$, $SD = .45$). This difference, .196, BCa 95% CI [-.421, .029], was not significant $t(62.07) = 7.67$, $p = .086$, however, it did represent a large-sized effect, $r = 0.70$. Furthermore, since the *p*-value is so close to being significant, there are only 8.6% chances that this difference is incidental.

Work Status

To examine if there was a significant mean difference between the health anxiety groups and if they were employed or attended school, an independent *t*-test was conducted. Results from the independent *t*-test revealed that 50% of patients in the high health anxiety group were employed or attended school ($M = .50$, $SD = .51$), and 69% of patients in the low health anxiety group were employed or attended school ($M = .69$, $SD = .47$). This difference, .188, BCa 95% CI [-.021, .396], was not significant $t(80.49) = 1.79$, $p = .077$, and it represented small-sized effect, $r = .20$. However, since the *p*-value is so close to being significant, there are only 7.7% chances that this difference is incidental.

MFI

A multivariate ANOVA was conducted with health anxiety groups (high versus low) as the between subject factor and the five dimensions of fatigue (general, mental, and physical fatigue, reduced motivation and reduced activity) as the dependent variables. Using

Pillai's trace, there was a significant effect of health anxiety on three of the five dimensions of fatigue, $V = 0.15$, $F(5, 83) = 2.86$, $p = .02$, indicating that individuals in the high health anxiety group reported more fatigue. Separate univariate ANOVAs on the outcome variables revealed significant effect on mental fatigue $F(1, 87) = 4.81$, $p = .031$, physical fatigue $F(1, 87) = 8.40$, $p = .005$ and reduced motivation $F(1, 87) = 4.15$, $p = .045$. There was not a significant effect on general fatigue $F(1, 87) = .28$, $p = .598$ or reduced activity $F(1, 87) = 2.76$, $p = .100$.

Discussion

The current study was a data based study, with the main purpose of examining the prevalence of health anxiety among individuals undergoing a fibromyalgia diagnosis at Praut. The results showed that high levels of health anxiety were found among 44.9% of the patients, indicating that health anxiety is a common problem among individuals with fibromyalgia. While assessing the cut-off point 18, results showed that 22.5% of the patients presumably meet diagnostic criteria for health anxiety, which illustrates furthermore that an actual problem exists among a high ratio of FM patients. These results are in line with other studies examining health anxiety among individuals with fibromyalgia (Ucar et al., 2015) and individuals with chronic pain (Rode et al., 2006), as recognized among FM patients.

The findings of the current study support the first hypothesis as patients with high health anxiety had significantly more severe fibromyalgia symptoms than those with low health anxiety. Despite that the difference on the mean scores was not large, the difference is present. Since higher scores on the FIQ indicate severer fibromyalgia symptoms, health anxiety may, to some extent, increase those symptoms.

The second hypothesis was also supported, as individuals with higher level of health anxiety had lower scores on the QOLS, compared with individuals with lower level of health anxiety. The average score on the QOLS for healthy individuals is 90, but for rheumatic

patients, the average score has ranged between 70 to 83 (Carol S Burckhardt & Anderson, 2003). The current study found that FM patients with higher level of health anxiety had the average score of approximately 70, but FM patients with lower level of health anxiety had the average score of approximately 80. Again, the difference on mean scores between FM patients with high and low levels of health anxiety in the current study is not large.

Nonetheless, FM patients with lower level of health anxiety have average scores that are rather close to the average scores of healthy individuals, meanwhile FM patients with higher levels of health anxiety have mean scores that are 20 points below mean scores of healthy individuals. Therefore, health anxiety may, to some extent, negatively affects FM patient's quality of life. These findings are in line with previous studies (Arnett et al., 2008; Hayter et al., 2016).

Mental health problems, such as depression and general anxiety have been shown to be common among FM patients (Hoffman & Dukes, 2007; Aguglia et al., 2011; Fuller-Thomson et al., 2012). The findings from this study reveal that higher rate of FM patients with high level of health anxiety met criteria for psychiatric disorders (based on MINI), compared to those with low level of health anxiety, which supports hypothesis three. These findings are in consistent with the findings of Sunderland et al. (2013), who indicated that individuals with health anxiety are up to six times more likely to have other mental health problems.

Hypothesis four was supported with the findings from the current study, whereas health anxiety negatively affects working status of FM patients, whereas approximately 70% of individuals with lower level of health anxiety were employed or attended school but only 50% of FM patients with higher level of health anxiety were employed or attended school. Previous studies have indicated that FM has an impact on working status, due to functional

impairment which is related to FM (Annemans et al., 2009). Therefore, it is interesting to see, how health anxiety, in some extent, seems to affect working ability among FM patients.

Studies have shown that fatigue symptoms are common among FM patients (Frederick Wolfe et al., 1995; Arnold et al., 2012; Hawkins, 2013). This relationship in context with health anxiety, was analyzed in the current study. A *multivariate analysis of variance* was conducted on five dimensions of sleep depending on high and low levels of health anxiety. A significant effect was found of mental and physical fatigue and of reduced motivation. These findings largely support hypothesis five, whereas health anxiety increases fatigue among FM patients. Overall, findings from the current study shed a light on the fact that higher level of health anxiety is related to other mental, physical and emotional health problems among FM patients and seems to lower their quality of life.

The study has some limitations. First, the patients sample size is relatively small, with 89 valid answers, which makes it difficult to generalize the results to the cohort. Despite that, significant health anxiety was found in almost half of the patients. Since this was a pilot study, there is a need for further investigation on the subject in a larger sample. Second, all measures are self-reported, increasing the possibility for bias where individuals may not always understand the questions. Third, the possibility to conclude causal relationship between variables was not present. However, as the literature reports, mental and physical problems have been shown to be associated with health anxiety (Arnett et al., 2008; Sunderland et al., 2013; Hayter et al., 2016). Therefore, it is likely that health anxiety adversely affects mental, physical and even social symptoms among FM patients.

Despite limitations, the present study also has strengths. Health anxiety has never been examined among Icelandic FM patients, therefore, these results demonstrate that the problem does exist in the Icelandic society. These findings are new to the Icelandic

healthcare, which makes these findings important to modernize the service to the patient needs. The current study is also a foundation for further researches on this topic in Iceland.

Based on the findings from this study, further researches are needed on the subject, where the primary focus should be to examine health anxiety on a broader range, specifically to examine the prevalence of health anxiety in the clinic to get results which applies to the whole population. Also, it would be interesting to examine the effectuality of cognitive-behavioral therapy for FM patients with high levels of health anxiety.

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