The effect of the 2008 recession on mental well-being and employment status of people with and without mental health problems

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Thesis for the degree of Master of Public Health Science

Center of Public Health
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HÁSKÓLI ÍSLANDS

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Áhrif efnahagshrunsins 2008 á andlega líðan og atvinnustöðu fólks með og án geðræns vanda

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Abstract

The 2008 recession caused increased unemployment and financial strain, which affected people´s mental well-being. People with mental health problems are a vulnerable subgroup who might have been hit particularly hard by the recession. In this study the aim was to assess the effect of the 2008 recession on the mental well-being and employment status of people with and without mental health problems. The study cohort existed of Icelanders aged 18-69 years who took part in the study *Health and Wellbeing of Icelanders*. The cohort was divided into groups of people with and without mental health problems depending on their answers to three questions about whether they had anxiety/tension, depression or other types of mental health problems.

Mental well-being was measured with the Short Warwick Edinburgh Mental Well-being scale (SWEMWBS) and the Perceived Stress scale 4-item version (PSS-4). Employment status was classified as being employed (working, being an employer or studying) and unemployed. Logistic regression was used to assess the effect of the recession on well-being and employment status using the year 2007 as a reference group. We also compared the risk of unemployment for people with mental health problems with people without mental health problems as a reference group.

The results showed no significant difference between years in terms of poorer mental well-being or high perceived stress for people with mental health problems. People without mental health problems had an increased risk of poor mental well-being (AOR:1.66 (95%CI:1.18,2.35) in 2009 and AOR:1.64 (95%CI:1.20,2.26) in 2012) and high perceived stress (AOR: 1.48 (95%CI:1.07,2.03) in 2009 and AOR:1.53 (95%CI:1.15,2.04) in 2012). Both groups had an increased risk of unemployment following the 2008 recession. Risk of unemployment was greater for people with mental health problems (AOR:2.84 (95%CI:1.36,5.60) in 2007, AOR:2.81 (95%CI:1.71,4.50) in 2009 and AOR:4.78 (95%CI:3.20,4.08) in 2012) than for people without mental health problems.

In conclusion, a similar proportion of people with mental health problems had poor mental well-being and high perceived stress through all the years. People

without mental health problems seemed to have been affected by the 2008 recession, showing significantly poorer mental well-being and higher perceived stress in 2009 and 2012 compared to 2007. The gap in unemployment between people with and without mental health problems increased after the 2008 recession.

Ágrip

Með efnahagshruninu 2008 fylgdi aukið atvinnuleysi og fjárhagslegir erfiðleikar sem hafði áhrif á andlega heilsu fólks. Fólk með geðrænan vanda er viðkvæmur hópur sem gæti verið í meiri hættu á að fara illa út úr efnahagsþrengingum.

Markmið þessarar rannsóknar var að bera saman almenna líðan og atvinnustöðu fólks með og án geðræns vanda, fyrir og eftir efnahagshrunið 2008. Rannsóknarhópurinn byggðist á íslensku þýði á aldrinum 18-69 ára úr rannsókninni *Heilsa og líðan Íslendinga*. Hópnum var skipt í tvennt eftir því hvort þeir voru með geðræn vandamál eða ekki en skiptingin byggðist á því hvort þátttakandi svaraði þremur spurningum um hvort þeir hefðu kvíða/spennu, þunglyndi eða annan geðrænan vanda, játandi eða neitandi.

Andleg líðan var mæld með 7 atriða Warwick Edinburg Mental Well-being kvarða (SWEMWBS) og 4 atriða Perceived Stress kvarða (PSS-4). Atvinnustaða var skilgreind sem, í vinnu (þ.m.t. atvinnurekandi og í námi) og atvinnulaus. Lógistísk aðhvarfsgreining var notuð til að meta áhrif efnahagshrunsins á almenna líðan og atvinnustöðu og var árið 2007 notað sem viðmiðunarár. Þá var lógistísk aðhvarfsgreining notuð til að meta atvinnustöðu fólks með geðrænan vanda þar sem fólk án geðræns vanda var sem viðmiðunarhópur.

Niðurstöður gáfu til kynna að engin marktæk breyting var á almennri líðan fólks með geðrænan vanda milli ára en fólk án geðræns vanda var líklegra til að sýna verri almenna líðan (AOR:1.66 (95%CI:1.18,2.35) 2009 og AOR:1.64 (95%CI:1.20,2.26) 2012) og meiri streitu (AOR: 1.48 (95%CI:1.07,2.03) 2009 og AOR:1.53 (95%CI:1.15,2.04) 2012) eftir efnahagshrunið.

Báðir hópar voru líklegir til að vera atvinnulausir eftir efnahagshrunið en hópurinn með geðrænan vanda var í meiri hættu á að verða atvinnulaus miðað við hópinn án geðræns vanda (AOR:2.84 (95%CI:1.36,5.60) 2007, AOR:2.81 (95%CI:1.71,4.50) 2009 og AOR:4.78 (95%CI:3.20,4.08) 2012).

Niðurstöður þessar benda til að hátt hlutfall fólks með geðrænan vanda þjáist af vanlíðan og streitu bæði í uppsveiflu og kreppu en fólk án geðræns vanda finnur fyrir meiri vanlíðan og streitu í kjölfar efnahagshruns. Einnig virðist hlutfall atvinnuleysis milli fólks með og án geðræns vanda aukast eftir efnahagshrun.

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Introduction

The economic crisis that took place in the fall of 2008 had major consequences for people worldwide (1). The increased unemployment as well as job insecurity and financial strain that people experienced had a significant impact on people´s mental health (1, 2). Many studies have shown the effect of the 2008 recession on people´s mental health (3-9). Icelandic studies have also shown an association between the 2008 recession and worse mental health, especially among women (10, 11). These studies focus on people without existing mental health problems and report worse mental health following the 2008 recession compared with before the recession. People with existing mental health problems are also vulnerable towards the economic crisis (12). Studies have shown that people with mental health problems were at higher risk of losing their job than people without mental health problems during the 2008 recession (13-15). There is however a paucity of studies about the changes in mental well-being of people with existing mental health problems compared to people without existing mental health problems during the 2008 recession.

This study focuses on the mental well-being and employment status of people with and without mental health problems during the 2008 recession in Iceland. Our hypothesis is that people with mental health problems reported worse mental well-being following the 2008 recession, than people without mental health problems. The findings of this study could shed important light on the status of mental well-being of people with mental health problems during an economic crisis. It might recognize that people with mental health problems as a vulnerable subgroup need special care and support during an economic crises.

This background is divided into two sections. First is a section about mental well-being, which includes chapters on the definition and prevalence of mental disorders. The second section discusses the effect of economic crises on mental well-being and the 2008 recession, how it started and the effect it had on employment status and mental well-being.

1. Mental well-being

Concern for mental well-being can be traced all the way back to ancient times in Greek philosophical writing but it was in the 1950s, after The World War II that mental well-being started to draw scientific attention (16). Since then the mental well-being has been an essential part of quality of life and related research has made important contributions to psychopathology (16). Mental well-being is a phenomenon that includes both positive factors such as social acceptance and pleasure but also negative aspects such as anxiety and suffering (17). There is a generalized agreement that the concept of mental well-being should be included in the definition of mental health along with the absence of diseases (18). In the The World Health Organization´s (WHO) definition of mental health, the mental health is "a state of complete physical, mental and social well-being and not merely the absence of disease" (18, 19).

The construct of well-being and the factors included in the concept have long been a source of debate (18). A review from Linton and colleagues on 99 generic measures of well-being for adults shows that the definition of well-being is neither clear nor complete (17). The evidence from the review points to a lack of mutual understanding on how mental-well being should be measured and what exactly should be measured. But the large number of well-being measuring instruments that are in use points to significant interest in the subject (17). There is widespread agreement that mental well-being should be understood and defined on a multidimensional level, emphasizing the interaction between the individual and the environment (17, 20).

1. 2. Mental disorders

Classifications of mental illness can be traced to the days of Hippocrates. In his classification of mental illness he included epilepsy, mania, melancholia, paranoia, toxic deliria (mental confusion caused by fever) and hysteria (21). The explanation Hippocrates and his companions had for these illnesses was based on the imbalance of blood fluids (21).

In the 1960s the World Health Organization (WHO) started to work on improving the diagnosis and classification of mental disorders. The results of this

work were used in the draft of the Eighth Revision of the Classification of Diseases (ICD-8) which included a definition of each category of mental health disorders (22). The work on the classification of mental disorders was then improved in the Tenth Revision of the Classification of Diseases (ICD-10) which included both diagnostic criteria for mental disorders and assessment instruments for research (22). The ICD and the Diagnosis and Statistical Manual of Mental Disorders (DSM) have been the main guidelines for defining mental disorders (23). The ICD-10 defines mental disorders as "the existence of a clinically recognizable set of symptoms or behavior associated in most cases with distress and interference with personal functions" (22). Mental disorders include mental and behavioral disorders like substance abuse, schizophrenia and schizotypal disorders, mood affective disorders (including depressive disorders), stress related disorders (including anxiety), personality disorders (including anxiety personality disorder) and other disorders (22).

The burden of mental disorders has been rising in all countries (24) and the prevalence of mental disorders today is high. According to WHO at least one in four people in Europe was affected by some type of mental disorders in 2005 (25). For example about 100 million of 870 million people living in Europe in 2005 suffered from anxiety and depression (25). In a 2010 report of a 12 months prevalence of mental and neurological disorders by Wittchen and colleagues, 38.2% of the European population was estimated to suffer from at least one type of mental disorder in 2010. This means that 164 million people in Europe were struggling with some kind of mental disorder in 2010 (26). Wittchen and colleagues state that mental and neurological disorders should be considered the biggest health challenge in the 21st century for Europe (26). Furthermore people with mental health disorders suffer more than other people from other kinds of diseases, such as acquired immune deficiency syndrome (AIDS)/human immunodeficiency virus (HIV), cancer and cardiovascular disease (27). They often struggle with alcohol and drug abuse and are more likely to face unemployment, divorce and discrimination such as social exclusion (25, 28). The suicide rate of people with mental disorders is also high (29). For example, in a study from Italy, people who were separated, divorced, widowed or unemployed

were at three times the risk of experiencing any mental disorder compared to people who were married or employed (30).

There are difficulties in measuring the actual prevalence of mental disorders. This is because many people with mental disorders do not seek health care assistance (29). There is also a gap between those needing treatment and the services that are available. In Europe around 44-70% of people with mental disorders needing treatment did not receive health care in 2005 (25).

Some gender differences can be seen in people with mental disorders. In 2011 the rate of mental disorders was higher for women (30.1%) than for men (23.4%) (26). The differences between genders are reflected in different types of mental disorders. Women seems more likely to suffer from anxiety and depression while men are more likely to be dealing with substance abuse and antisocial behavior (31). According to a study in Italy women were three times as likely as men to suffer from mental disorders (30).

1. 2. 1. Depression

One of the most common mental health problems is depression (32). It has a more detrimental effect on communities than many physical diseases (32, 33). The WHO´s definition of depressive disorder emphasizes negative feelings such as losing interest in things, feeling sadness or guilt and low self-worth (34). Depressed people might experience interrupted sleep, loss of or increased appetite and concentration problems (34). Depression is more than a short-lived emotional response and mood fluctuation in everyday life (35). Depression can impair people´s ability to work and can affect people´s ability to cope with everyday life (34). According to the Internal Classification of Diseases (ICD-10) depressive episodes can be categorized as mild, moderate or severe (22). There is a distinction between unipolar depressive disorder and bipolar affective disorder. Unipolar depressive disorder involves repeated depressive episodes with loss of interests lack of enjoyment and reduced energy. Some people with unipolar depression also suffer from anxiety (35). Bipolar affective disorder includes both manic and depressive episodes where the manic episodes consist of over-activity, irritable mood, hyper-activity, increased self-esteem and reduced need for sleep (35). Major depressive disorder is the most serious case

of depression where the depressive disorder can be a long-lasting and severe and in the worst cases can lead to suicide (28, 34). The attributable risk of suicide attempts among people with depression was found to be 28% (29). In the ICD-10 the criteria for mild depressive episodes are that two or three depressive symptoms should be present and the person feels distressed but is able to cope with everyday life (22). For moderate depression four or more symptoms should be present and the person has difficulties in coping with every day life (22).

In the Diagnostic Statistical Manual of Mental Disorders (DSM-5) the classification of depressive disorders differs from that given by ICD-10 (36). According to DSM-5 the depressive disorders include among others, disruptive mood dysregulation disorder, major depressive disorder and persistent depressive disorder (36). The criteria for the diagnosis of major depressive disorder by DSM-5 include that depressive symptoms such as sadness or depressive mood throughout the day, reduced interests in things, insomnia or hypersomnia, weight loss or weight gain, feelings of worthlessness, concentration problems and thoughts of death are sustained for two weeks straight (36).

Depressive disorders form a significant share of the mental disorders burden worldwide (37). In 2015 the prevalence of people suffering from depressive disorders was estimated to be 4.4% worldwide, counting over 300 million people (34). The number of people with depressive disorders increased by 18% from 2005 to 2015 because of the increasing global population and the growing number of older people, who are the most vulnerable towards becoming depressed (34). A study by Kessler and colleagues showed that the most prevalent lifetime disorder in the USA in 2001-2003 was major depressive disorder (38).

In a 2010 report of the size and burden of mental disorders in 30 European countries depressive disorders accounted for 7,2% of the overall burden of diseases and were the second most frequent group of disorders, with major depressive disorder being the most common depressive disorder with a rate of 6.9% (26). The prevalence of depressive disorders has been high among working-age people in Europe and specifically in urban centers (33). A study by

de Girolamo and colleagues of common mental disorders in Italy showed that one in five participants had suffered from a mental disorders at some point in their lives (30). The most common mental disorders, according to de Girolamo and colleagues, were major depression and specific phobias (30). Around one in ten participants in Italy met the criteria for major depression sometime in their lives (30). In Finland in 2004 the most common mental disorder was found to be depressive disorder with a prevalence of 3.4% for men and 6.3% for women (39). The inhabitants of the northern part of the country had the highest prevalence of major depression (39). In addition participants who were younger, separated or divorced had higher risk of major depression (39). Depressive disorder was also common among unemployed males, with a prevalence of 11% (39).

1. 2. 2. Anxiety

Another common mental health problems is anxiety (40). Anxiety disorders often begin in childhood, adolescence or in early adulthood (40). The symptoms often increase at middle age and then decrease again at older ages (40). Anxiety disorders that begin in childhood or adulthood can have a severe disabling effect on social functioning and can predict psychopathology later in life (41). What characterizes anxiety symptoms are anxiousness and the feeling of fear or avoidance of difficult external or internal stimuli (28, 41). According to DSM-5 the classification of anxiety disorders includes among others, separation anxiety, specific phobias, social anxiety disorder, panic disorder and general anxiety disorder (36). Anxiety is often a part of a major depression diagnoses and a symptom in other diagnosis such as autism spectrum disorder, bipolar disorder and substance abuse disorder (42).

Different patterns have been observed among patients with anxiety disorders. Those who have panic disorder often believe they have a physical problem instead of a psychiatric problem and get examined repeatedly while patients with phobias attempt to hide their problems (40). Anxiety patients often do not seek professional help because of the shyness and shame they feel about their symptoms (40). Sometimes anxiety patients are not diagnosed correctly.

Patients with generalized anxiety disorder symptoms who have some physical symptoms are likely to be diagnosed with something physical rather than anxiety symptoms (43).

According to epidemiological studies one third of the population is affected by anxiety sometime in their lifetime (40). In 2015, 264 million people globally were estimated to suffer from anxiety symptoms (34). The population of people with anxiety symptoms was found to increase between 2005-2015 by 14.9% worldwide (34). In the USA anxiety was the most prevalent class of mental disorder in 2001-2003, with a prevalence rate of 28.8% (38). In a 2010 a report of the size and burden of mental disorders in 30 European countries, anxiety disorder was one of the most prevalent disorders with a prevalence rate of 14%, suffered by an estimated of 69.1 million people (26). The prevalence of anxiety disorders seems to vary across countries, ranging from 2.4% in Italy to 29.8% in Mexico but the highest prevalence tends to be in European countries and the USA (41). In Finland anxiety disorder was the third most common mental disorder and the prevalence was a little higher among women than for men (39). In Iceland there were around 32,294 cases of anxiety disorder in 2004 or a prevalence of 11% (44).

1. 2. 3. Psychological stress – perceived stress

There is a bidirectional relation between mental illness and stress. Individuals who live with mental illness often suffer from perceived stress (45). The most observed stress symptoms are tension, irritability and negative affective tone but the most serious effects of stress can lead to serious mental health problems (46). The most common forms of affective expression in stressful settings are depression and anxiety (46).

In Western culture, stress has been described as a feeling of a loss of control (47). According to Lazarus and Folkman the definition of stress involves interaction between the individual and the environment (48). It depends both on the nature of the stimuli in the environment and the individual´s ability to cope with these stimuli (48). Stress has also been defined as the wear and tear of the body (47).

Stress can be of different types. The most common stress form is *acute stress* which comes from too much pressure and demands from the environment (49). Those who experience acute stress frequently suffer from *episodic acute stress. Chronic stress* is another type of stress and is most likely the worst kind of stress as it can have a serious effect on people (49).

The events that provoke a stress reaction can vary from one person to another. How the individual *perceives* the situation is important. What one person might perceive as stressful does not cause stress to another person. No one perceives the same situation in the same way (47). The experience of stress can be triggered by people´s realization of how difficult it is to cope with threats and demands (50). These difficulties can cause anxiety and depression. Stress scenarios can occur when an individual fails to cope with demands and becomes concerned about that failure (50). Stress results when an individual is confronted with a situation he perceives as overwhelming and has problems coping with (51). Stress is a complex concept but the part of stress that is measured is how one feels when under stressed or perceiving stress. This aspect can be assessed using scores that are based on how the participants perceives the impacts of the events (46, 52). The perceived stress scale (PSS) is used to measure perceived stress and measures to what degree situations in the individual´s life are considered stressful (53).

It is difficult to find an accurate prevalence of stress worldwide but according to the American Psychological Association, 22% of Americans reported extreme stress in 2011 which was lower than in 2008, where 30% of Americans reported extreme stress (54). Even though fewer Americans reported extreme stress in 2011 than in 2008, a higher proportion of people (39%) said that their stress had increased over the past year, while 44% said their stress had increased over the past five years (54). In a study conducted in Canada perceived stress decreased from 2001 to 2007 (55). Cohen and Janicki-Deverts found that perceived stress increased during the 2008 recession among white people, men, the age-group 45-64, and among those who were employed full time (56). In 1983 and 2006 but not in 2009, those who were unemployed reported more stress, than those who were employed (56). In Sweden 41% of primary health care patients reported perceived stress in 2009; 37% of the patients were

women and 49% were men. Those who were most stressed also had depressive symptoms (57). Another Swedish study by Bergdahl and Bergdahl showed that the prevalence of moderate stress was estimated at 10% in 2002 but the prevalence of high stress was 4%. Women aged 30-34 reported the most perceived stress (58).

2. Economic collapse

The primary purpose of this study was to explore changes in mental well-being during and after the 2008 recession in Iceland. This second section discusses economic crisis, the 2008 recession and its effect on employment status and mental well-being.

2. 1. The effect of economic crises on mental well-being

The most important social environment affecting people´s well-being is the economic system. The social cost of job loss has been well documented (59). Economic crisis has been related to psychological distress, suicide, increased use of mental health services and higher prevalence of common mental disorders (12, 60, 61). During economic crises people suffer from financial stress, which makes them vulnerable towards mental disorders such as depression (62). Tausig and colleagues studied the effect of the recession in 1974-75 in the United States on mental distress (63). They found that distress increased by a one half standard deviation and dissatisfaction increased by one fourth of standard deviation during the recession (63). Their model showed a 50% of increase in distress and a 90% of increase in dissatisfaction as a result of the recession (63).
In the 1990s a recession took place which affected countries such as Finland, Sweden, the USA and the UK. In Finland there was a fall in gross domestic product (GDP) which led to economic crisis and increased unemployment (64). In Sweden there was a fall in the value of the Swedish currency, a decrease in inflation and increased unemployment (65). The UK suffered from a small bank crisis that resulted in bank failure and threatened the stability of the financial system (66). In the USA the recession was caused by a weakened economy as an

effect of the Gulf Crisis (67). During the recession in Finland, a study by Viinamaki and colleagues found a higher rate of women suffering from mental disorders compared to men (64). The reason for this difference was considered to be that the unemployment rate for men began to improve towards the end of the study period. However the unemployment rate for women showed no signs of improving, leaving them more vulnerable at the end of the study period (64). The study also showed that women used more psychoactive drugs than men and the conclusion was that men were better adapted to recession than women (64).

In Sweden unemployment among young people increased during the 1990s recession as did use of antidepressants among young people (68). The recession caused increased anxiousness and anguish among depressed people and people with other psychiatric disorders (68). Swedish women were particularly vulnerable towards the recession (65). During the 1990s recession in the United States there was increased unemployment in Los Angeles which resulted in increased stress and negative effects on mental health (69). Katikireddi and colleagues conducted a study in England measuring mental health using the General Health Questionnaire-12 (GHQ), a screening tool for depression and anxiety. The prevalence of depression and anxiety was consistently high for women while the prevalence for men increased between 1991 and 1992 (70). The most interesting result of this study was that the increase in unemployment did not result in increased prevalence of depression and anxiety (70).

Japan was hit by an economic collapse in 1998 with a fall in the currency value, higher rate of bankruptcies and a rise in unemployment (71). This economic crisis lead to the highest recorded peak in suicide rates in Japan (72). Both neuroticism (causing individuals to be instable and anxious) and psychoticism (causing individuals to be aggressive, cold and egocentric) were associated with increased suicide risk (73). People with neuroticism were more vulnerable towards social stress caused by the economic crisis (72, 73).

Zivin and colleagues argue that the results of studies on the effect of economic crises on mental health should encourage health care systems and policymakers to take action (12). They should take into consideration the health and social impact of economic crises and create new prevention and recovery policies and agendas such as social protection programs (12).

2.2. The 2008 recession

The 2008 economic collapse was the worst economic crisis since World War II and affected many western countries (74), leading to an increase in unemployment both in Europe and the United States and having a significant effect on people´s mental well-being (1). The 2008 recession started in around December 2007 in the United States and had a substantial impact on the labor market (74). The biggest banks and insurers in the United States collapsed and the unemployment rate went from 4.4% in the prerecession period to 10.1% in October 2009 which was the largest increase in unemployment rates since World War II (74, 75). Because of the unique depth and duration of this recession, it has been regarded as the worst economic downturn since World War II and has been referred to as The Great Recession (74, 76).

In the fall of 2008 global trade took a free fall, which led to cutbacks in production and an increase in global unemployment. The Great Recession led to a job crisis and growing job insecurity with severe consequences for individuals, families, households and communities, such as job loss, reduced income and pay cuts (1, 75, 77). This global economic crisis also led to the rise of mental disorders in western European and US populations (77).

In Iceland the economic crisis began in autumn 2008 with the collapse of the bank system. The Icelandic government took over the biggest banks, Glitnir, Landsbanki and Kaupthing by implementing the so-called Emergency Act (78). The effect of this collapse was a significantly reduced income in both households and companies as well as an increase in unemployment in Iceland (78).

2. 2. 1. The effect of the 2008 recession on mental health

Epidemiological data has shown a relationship between the 2008 recession and increased mental health problems as well as a correlation between the recession and an increase in the prevalence of common mental disorders (60). It has been found that the 2008 recession had a negative effect on mental health, both at the individual level and population level (2, 3). The results of a systematic review of the health impacts of the 2008 recession in developed countries show that there

was an increased risk of psychological distress among people who were unemployed, were under financial strain and were facing housing crises (2). At the population level the 2008 recession caused increased psychological stress and increased suicide rates (2).

Many studies have been conducted on the effect of the 2008 recession on mental health across many countries. For instance there was a significant increase in mental health problems in Basque Country, especially among men aged 35-44 and this increase could not be explained by increasing unemployment rates alone (3). There was also an increase in mental health problems among students in Basque Country (3). The 2008 recession had a significant impact on mental health in Greece and there was a higher risk for major depression in 2011 compared to 2008 (4, 5). In Hong Kong the prevalence of major depression was significantly higher during the 2008 recession for both men and women (6). The prevalence was 8.5% in 2007 but increased to 12.5% in 2009 (6). Those who were most vulnerable towards major depression were people aged 55-65, with secondary education, and who were married, employed and had low or high-middle income (6). In Spain there was a direct relation between the 2008 recession and an increased suicide rate (7). There was an 8% increase in suicide rates after the 2008 recession, predominantly amongst men and working age people (7). In Australia there was increased prevalence of anxiety during the 2008 recession however research also showed decreased psychological distress (8). Women were more vulnerable towards anxiety and psychological distress than men (8). A Canadian study showed increased prevalence of major depressive disorder at the start of the 2008 recession. The increase was predominant in men and in participants who were married or in a relationship (77).

In a study by Modrek, Hamad and Cullen there was evidence of an increased utilization of outpatient and inpatient mental health care services among workers in the United States, just after the 2008 recession (9). Mental health was worse among working men (9). In addition there was increased use of mental health related medication such as anti-depressant, sleep aids and anxiolytics (9).

A few studies have been done in Iceland on the effect of the 2008 recession on mental health. In a study by Hauksdóttir and colleagues there was evidence of an

increased stress, particularly among women in sensitive situations such as unemployment, during the 2008 recession in Iceland (11). McClure found in his study of mental health and mental behavior in Iceland during the 2008 recession that depressive symptoms and stress increased for women but not for men (10). A study by Rangarsdottir and colleagues showed that perceived standard of living had an effect on feelings of injustice and frustration for those individuals who felt the recession harmed them more than others (79). Ragnarsdottir and colleagues assumed that these expectations and social comparisons could have exaggerated the impact of poorer living condition on individual´s distress (79). Gudmundsdottir did a study on changes in happiness among the Icelandic population aged 18-79 years, during the 2008 recession and found that there were few changes between 2007 and 2009 (80). The happiness score decreased from 8.1 in 2007 to 7.95 in 2009 (where the score 10 was the highest). The most vulnerable groups during the recession were those experiencing financial difficulties (80).

2. 2. 2. The effect of the 2008 recession on unemployment

In a study of 30 European countries there was an increase in unemployment in almost every country during the 2008 recession (except for Austria, Belgium, France, Germany, Switzerland and The Netherlands). The increase was highest in the eastern and southern European countries (76).

Increased unemployment in 23 European countries had an effect on people´s mental health. One standardized unemployment rate was found to be associated with a 4.1% increase in suicides (81). In a geographical study of unemployment in the USA there was increased inequality between counties´ labor markets and over 7.5 million jobs were lost between 2007 and 2009 (82). In a comparative study of Spain and the Czech Republic the unemployment rate was lower in the Czech Republic compared to Spain but the rate was higher among younger workers than older in both countries and the gap increased during the 2008 recession (83). In the Czech Republic younger males with low education were at the most risk of losing their jobs while in Spain the most educated employees were at double the risk of losing their job (83). The unemployment rate in Spain

went from 8.5% in 2007 to 27.2% in the beginning of 2013 (84). There was also increased unemployment during the 2008 recession in Italy (85). In 2009, 25.7% of families in Italy experienced the worsening employment status of at least one member of the family (85). A study done in the USA and Europe among older workers showed an increase in unemployment, from 1.3% in 2006 to 3% in 2010 in the USA and from 1.8% in 2006 to 3.1% in 2010 in Europe (86).

2. 2. 2. 1. The 2008 recession; the effect of unemployment on mental well-being

Losing a job makes people more vulnerable and this vulnerability can affect people´s mental health. Working conditions and income inequality also affect people´s mental health (60). In addition unemployment and financial difficulties can have a damaging effect on a person´s well-being (87).

The people who lost their jobs during the 2008 recession in Sweden were at higher risk of suffering from mental distress than those who were employed and the risk increased the longer they remained unemployed (88). The risk was greater for women than for men (88). In Greece mental health was negatively affected by unemployment during the 2008 recession and women´s mental health was more affected than men´s (5). Long term unemployment and debt along with social isolation, poor housing and nutrition were the main reasons for vulnerability towards mental health problems (5). Unemployment, especially long term unemployment, along with stress and anxiety about the future had a negative impact on mental health in a study among the Spanish population (84). There were indications of increased depressive symptoms related to unemployment in both the USA and Europe during the 2008 recession (86).

Urbanos-Garrido and Lopez-Varcarcel point out the need to prevent worsening mental health during economic crises, particularly among vulnerable groups such as unemployed people (84). Catalano and colleagues found in their meta analysis that the most dominant mechanism in economic crises was stress because during an economic crises the increased likelihood of individuals experiencing work-related stress and financial difficulties could probably lead to them experiencing other stressful events (89). Experiencing undesirable job situations and financial difficulties could lead to psychological and behavioral

morbidity (89). A study on workers in Spain showed evidence of association between employment uncertainty and poor mental health and the association increased as the uncertainty increased (90). The association was stronger for women than for men (90).

McClure (2014) found out that employment status might have a significant effect on changes in mental health in Iceland (10). Unemployment was shown to be a significant risk factor for depressive symptom for both men and women (10). There was a strong (but not significant) trend of increased risk of depressive symptoms for both men and women who lost their job during the 2008 recession in Iceland (10).

2. 2. 3. The 2008 recession; mental health problems and unemployment

People with mental disorders can be particularly vulnerable towards economic recession (12). Individuals with poorer mental health are more likely to report economic stress during economic contraction and show a greater number of psychiatric symptoms than other people (69). They can also show decreased psychological functioning (69). Economic crisis can lead to increased incidence of seeking psychological help because of the low tolerance of people with mental health problems of economic insecurity (61).

People with mental disorders are more likely to be unemployed or excluded from the workforce and these risks are higher with more severe mental illness (14, 91). The odds of being depressed are twice as high when one is unemployed (92). Job loss functions as a trigger of mental disorder (92). A study by Luciano and Meara showed that the more severe the mental illness the greater the risk of unemployment (14). The employment rate was 76% for people without mental illness, almost 69% for those who had mild mental illness, nearly 63% for those who had moderate mental illness and 55% for those who had serious mental illness (14). People who had serious mental illness were most likely to be unemployed after the age of 49 (14). A study done in 27 European countries by Evans-Lacko and colleagues, showed a gap in unemployment rate between people with and without mental health problems between 2006 and 2010 (13). The unemployment rate was higher among people with mental health problems and the gap was wider in 2010 compared to 2006 (13). Starace and colleagues

did a similar study in Italy with the same results, there was an increased disparity in unemployment rate between people with and without mental health problems during the 2008 recession (15). In a meta analytic study by Paul and Moser the rate of unemployment among people with psychological problems was 34% while the unemployment rate of people without psychological problems was 16% (93). Gender, occupational status and unemployment duration were significant moderators of distressing factors of unemployment (93).

Summary

Studies have shown that economic collapse such as the 2008 recession increase the unemployment rates and can have a detrimental effect on the mental health of the general population. Few studies have compared unemployment of people with and without mental health problems following the 2008 recession. Those that have been published show an increased gap in unemployment rates between the groups, where people with mental health problems were at a higher risk of being unemployed. What is not known is whether there were changes in the mental well-being of people with mental health problems following the 2008 recession and whether these changes differ from the changes in mental well-being of people without mental health problems. This study contributes to existing studies by assessing the mental well-being and unemployment rate of people with and without mental health problems in order to investigate the impact of the 2008 recession on these groups taken separately.

Aim

The aim of this study was to assess the effect of the financial collapse in 2008 on the employment and self-assessed well-being of people with and without pre-existing mental health problems.

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Article

The effect of the 2008 recession on the mental well-being and employment status of people with and without a history of mental health problems

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Abstract

Objectives: This study investigates the effect of the 2008 recession on the self assessed well-being and employment status of people with and without mental health problems.

Methods: The study cohort included participants from the study of *Health and Well-being of Icelanders*, aged 18-69 years. Self-assessed health was measured using a short Warwick Edinburgh Mental Well-being Scale (SWEMWBS) and the 4-item Perceived Stress Scale (PSS-4). Logistic regression was used to assess the effect of the 2008 recession on self-assessed well-being and employment status in 2009 and 2012 among people with and without mental health problems, using 2007 as a reference group

Results: People without mental health problems had increased risk of poorer well-being in both 2009 (AOR: 1.66, 95%CI:1.18,2.35) and in 2012 (AOR: 1.64 , 95%CI:1.20,2.26) compared with 2007 as well as higher perceived stress (AOR: 1.48, 95%CI: 1.07,2.03 in 2009 and 1.53, 95%CI:1.15,2.04 in 2012). No significant change was observed in people with mental health problems. Both groups of people with and without mental health problems had increased risk of unemployment in 2009 and 2012. When comparing these groups, the risk of unemployment was higher for people with mental health problems and increased between 2007 and 2012.

Conclusion: The people without mental health problems were affected by the 2008 recession, showing significantly poorer well-being and higher perceived stress in 2009 and 2012 compared to 2007. The gap in unemployment between people with and without mental health problems did increased following the 2008 recession.

Introduction

In the fall of 2008 the global trade took a free fall, which lead to cutbacks in production and an increase in global unemployment. The 2008 economic crisis led to a job crisis which had a severe effect on individuals, families and communities around the world (1, 75). The 2008 recession has been regarded as the worst global economic downturn since World War II and is often referred to as The Great Recession (74, 76).

Recent studies have shown an association between the 2008 recession, increased psychological stress and poorer mental health among people in the USA and Europe (2, 94). The impact of the 2008 recession led to increased mental health problems in Basque Country (3) and greater risk of major depression among people in Greece, Hong Kong and Canada (4, 6, 77). The increase in unemployment rate following the 2008 recession, was related to depressive symptoms both in the USA and Europe (86).

During a recession people with pre-existing mental health problems are at greater risk of being dismissed from work than people without mental health problems and are therefore more likely to be unemployed (14, 61). Furthermore, a positive association has been found between the severity of mental health problems and the risk of unemployment (14). A study by Luciano and Meara, conducted during the 2008 recession, showed that people with serious mental illness were less likely to be employed compared to people without mental illness (14). Moreover the gap in unemployment rate between people with and without mental health problems was found to increase during the 2008 recession (13). The findings of previous studies, comparing the employment status of people with and without mental health problems during the 2008 recession, indicate higher unemployment rates for people with mental health problems (13-15). Previous studies have investigated unemployment of individuals with and without mental health problems by using cross sectional data and two time points. This study expands existing research by utilizing a representative cohort of the Icelandic population to explore changes in mental well-being and unemployment status among individuals with and without mental health problems using three time points: 2007, 2009 and 2012.

Materials and Methods

Study population

The study cohort was based on participants who responded to the questionnaire *Health and Wellbeing of Icelanders* published by the Icelandic Public Health Institute. Questionnaires were sent out at three time points: in October to December 2007 and October to November in both 2009 and 2012. The survey population were Icelandic citizens, aged 18-79, with a permanent residency in Iceland and who were able to answer the mailed questionnaire in Icelandic (95). Mailed questionnaires were sent out to 9807 randomly selected individuals in 2007 (response rate 60.3%) (95). In 2009, the 5294 individuals who answered the 2007 questionnaire were asked to participate again (response rate in the 2009 wave was 77,3%) (96). In 2012, the questionnaire was sent to 6434 new individuals (response rate 55%) and in addition 3246 participants from the 2007 survey were invited to participate in 2012, with a response rate of 88.7% (97). The final cohort therefore included 5909 participants in 2007, 4092 participants in 2009 and 6783 participants in 2012. The survey included questions about mental and physical health and demographic factors such as employment status, residency and financial status.

The study cohort was based on the participants who answered the *Health and Wellbeing* study questionnaire in all three years; 2007, 2009 and 2012. Participants were sorted into two groups, according to their mental health status in 2007. Information on mental health status in 2007 was obtained from answers to three questions in the *Health and Wellbeing* survey:

1. Have you ever had chronic anxiety/tension?
2. Have you ever had chronic depression?
3. Have you ever had other mental health problems?

Response options in the 2007 and 2009 waves were “yes I have it now”, “I did but not anymore” and “no I never have”. In the 2012 questionnaire the response options were “Yes I have it now “, “I do not have it now but had it within the last 12 months”, “I do not have it now but had it for more than 12 months ago”, and “I never have” (97).

Participants who responded “yes, I have it now” were classified as having mental health problems and those who responded “no, I never have” were classified as not having mental health problems. Participants with previous mental health problems, who answered “I did but not anymore”, “I do not have it now but had it within the last 12 months” and “I do not have it now but had it more than 12 months ago” were excluded from the study for all years.

Measures

Outcome variables

The outcome variables were self-assessed mental well-being, perceived stress and employment status. Mental well-being was assessed using the *Warwick-Edinburgh Mental Well-being Scale (WEMWBS)* and perceived stress was assessed using the *Perceived Stress Scale (PSS).*

The Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS)

WEMWBS is a validated scale measuring mental well-being for people aged 13-74 years old (98, 99). The statements are positively formulated and meant to describe the participant’s feelings in the past two weeks. Response options are on a 5-point Likert scale, ranging from 1=never to 5=always (99). The SWEMWBS is a 7-items scale with a score ranging from 7-35 points. The SWEMWBS has been found to have a strong measurement validity and sufficient internal consistency (100, 101). The cutoff score between high and low mental well-being was defined as a score equal to or over 19.3 according to NgFat and colleagues (102).

Perceived stress scale (PSS)-4

The PSS-4 is a shorter version of the Perceived Stress Scale and is a scale designed for measuring stress in community samples (53). PSS-4 is a 4-item scale, with items stated both positively and negatively, about perceived stress during the past month. Response options are on a 5-point Likert scale, ranging from 0 =never to 4 =very often. The total score ranges from 0-16 with a higher score indicating more perceived stress (97). In this study high perceived stress was defined as scores above the 90th percentile in accordance with Hauksdottir and colleagues (11).

Employment status

In the *Health and Well-being* study the question about employment status was simply "Are you…." followed by 11 different categories. These categories were: pensioners, on 50-74% disability, on 75% disability, not working, on sick leave, maternity leave, homemaker, working, employer, working part time/part time unemployed and studying.

In this study employment status was classified as *employed* (working, employers, part time working/part time unemployed and studying), *unemployed* (not working), *on disability* (50-75% disability and 75% disability) and *other* (currently on sick leave, maternity leave or homemaker). Pensioners were excluded from the study.

Statistical analysis

A Chi square test was used to assess the statistical significance, as shown in Table 1, with $p<0.05$ indicating statistical significance.

Logistic regression was used to assess the effect of the financial collapse in 2008 on poor mental well-being, high perceived stress and employment status for people with and without mental health problems. Odds ratio and 95% confidence intervals (CI) were calculated for both groups with and without mental health problems during the years 2009 and 2012 with 2007 as the reference point. For the analysis of employment status, logistic regression was used to assess the risk of unemployment of people with mental health problems in 2007, 2009 and 2012, with people without mental health problems as the reference group. The variables *on disability* and *other* were excluded from the models regarding employment status. The models were adjusted for residency and employment status (only for self-assessed well-being and perceived stress) and stratified by age and gender.

Statistical analyses were conducted in R and R Studio, version 1.0.136

Approval

The study was approved by the Bioethics Committee of Iceland and the Data Protection Authority of Iceland. The license number of the studies are:

07-081 for the 2007 study

09-094 for the 2009 study

212-107 for the 2012 study

Results

The study included people with and without mental health problems who responded to the *Health and Wellbeing* survey in 2007, 2009 and 2012 in Iceland. Table 1 shows the outcome variables and demographic characteristics of the groups with and without mental health problems, stratified by year.

In the group of people with mental health problems, women made up around 60% of the participants for all three waves (2007, 2009 and 2012). The employment of people with mental health problems was close to 60% in all three years but the rate of unemployment rose through the years (p=0.003). There was no significant difference in low mental well-being or high perceived stress between the waves among people with mental health problems.

The group without mental health problems was a little older than the group with mental health problems and got significantly older through the waves (p<0.001). For the group without mental health problems, the rate of employment increased through the waves but the rate of unemployment peaked in 2009 (p<0.001). There was a significant difference between the waves in terms of low mental well-being (p= 0.036) and high perceived stress (p= 0.025) for people without mental health problems.

SWEMWBS

Among people with mental health problems no significant difference was found in mental well-being between the years (Table 2). For the group without mental health problems, there was an increased risk of low mental well-being for both 2009 (AOR:1.66, 95% CI:1.18,2.35), and 2012 (AOR:1.64, 95%CI:1.20,2.26) compared with 2007 (Table 2). This association was significant for women in

2009 (AOR:1.87, 95%CI:1.17,3.00) compared with 2007, but not significant for men. The risk of low mental well-being was higher for men in 2012 (AOR: 1.72, 95%CI:1.11,2.71) than women (AOR:1.56, 95%CI:1.00,2.46). For people without mental health problems aged 18-39 years, the risk was more pronounced for the years 2009 (AOR: 2.02, 95%CI:1.27,3.23) and 2012 (AOR: 1.74, 95%CI:1.13,2.71) compared with 2007, but was not significant for people aged 40-69 years.

PSS-4

Among people with mental health problems no significant difference was found in perceived stress between the years (Table 3).

People without mental health problems had an increased risk of high perceived stress in 2009 (AOR: 1.48, 95%CI:1.07,2.03) and 2012 (AOR:1.53, 95%CI:1.15,2.04) compared with 2007 (Table 3). This risk was more pronounced among women (2009: AOR:1.54, 95%CI:1.01,2.35, 2012: AOR:1.66, 95%CI:1.14,2.44) and not significant among men. Similarly, the risk was more evident among people aged 18-39 years (2009: AOR:1.40, 95%CI:0.90,2.19, 2012: AOR:1.80, 95%CI:1.23,2.65) and not significant among people aged 40-69 years.

Employment status.

For the group with mental health problems there was an increased risk of unemployment in both 2009 (AOR:3.55, 95%CI:1.78,7.46) and 2012 (AOR:3.95, 95%CI: 2.12,7.95) compared with 2007 (Table 4). This association was stronger among men in both in 2009 (AOR:9.38, 95%CI:2.94,41.82) and 2012 (AOR:8.40, 95%CI:2.77,36.49) but the confidence intervals were large, indicating low precision level. For women, the risk was lower in 2012 (AOR:2.58, 95%CI:1.22,5.96) than for the overall group and not significant in 2009 compared with 2007. The younger age group had more pronounced increased risk of unemployment than the overall group (2009: AOR:5.67, 95%CI:2.10,18.04, 2012: AOR:5.82, 95%CI:2.31,17.82) whereas the risk was lower for the older age group in 2012 (AOR: 2.69, 95%CI: 1.19,6.90) and not significant in 2009.

For the group without mental health problems there was an increased risk of unemployment both in 2009 (AOR:4.08, 95%CI:2.61,6.57) and 2012 (AOR: 2.56, 95%CI:1.64,4.12) compared with 2007. This association was similar for both men and women without mental health problems. However, it was more pronounced than in the overall group without mental health problems, for people aged 40-69 years both for 2009 (AOR:7.46, 95%CI:3.37,19.74) and 2012 (AOR:4.19, 95%CI:1.89,11.12) compared with 2007, but one must keep in mind the large confidence interval, indicating a low precision level. The risk of unemployment was lower for the younger age group than for the overall group in both 2009 (AOR:2.93, 95%CI:1.66,5.27) and 2012 (AOR:2.03, 95%CI:1.16,3.63) compared to 2007.

Table 5 shows the logistic regression of unemployment status for 2007, 2009 and 2012 for people with mental health problems compared to people without mental health problems. People with mental health problems were at greater risk of being unemployed all in years; 2007 (AOR:2.84, 95%CI:1.36,5.60), 2009 (AOR:2.81 95%CI:1.71,4.50) and 2012 (AOR:4.78, 95%CI: 3.20,4.08) compared to people without mental health problems. This risk was more pronounced among men in 2009 (AOR:4.09, 95%CI:2.04,7.83) and 2012 (AOR:6.45, 95%CI:3.51,11.67) than women and was also more pronounced among older people (2007: AOR:9.03, 95%CI:2.97,28.36, 2009: AOR:2.83, 95%CI:1.34,5.54, 2012: AOR:5.85, 95%CI: 3.37,10.01) than younger people.

Discussion

This study examined changes in mental well-being and employment status before and after the 2008 recession, finding no significant changes in mental well-being and perceived stress among individuals suffering from mental health problems before and during the recession. However we found that participants without mental health problems had an increased risk of low mental well-being and high perceived stress both during and after the 2008 recession. Furthermore we found an increased risk of unemployment in both groups of people both during and after the 2008 recession.

Prior studies have mainly focused on the general population, finding that the 2008 recession was associated with poorer mental health among the general population (60). For instance, in a recent systematic review assessing health outcomes in Europe, 14 of 41 studies reported poorer mental health following the 2008 economic crisis (94). Another systematic review by Mucci and colleagues found that stress did increase during the 2008 recession and the recession had a negative effect on the mental health of working people (103).

This is in line with our findings of worse mental well-being and high perceived stress following the 2008 recession among people without mental health problems.

Increased unemployment during the 2008 recession has been found to be a major factor in decreased mental well-being (60). A study from Greece showed that the unemployment had a more devastating effect on mental health when the unemployment rate was high (5). These results are in line with our findings of an increased risk of unemployment following the 2008 recession for people without mental health problems.

There is a paucity of studies investigating the impact of the 2008 recession on mental health separately for people with and without mental health problems. Our study found that poor self-assessed well-being and high perceived stress among people with mental health problems did not increase during the recession. A similar proportion of people with mental health problems had low mental well-being and high perceived stress before and after the 2008 recession even though the rate of unemployment rose. It might be expected that they would suffer from more stress and worse mental well-being following the recession. It is possible that people with mental health problems often have to deal with a diversity of problems in addition to unemployment. Previous studies indicate that individuals with mental health problems are more likely to suffer from diseases such as human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), cancer and cardiovascular disease and are more likely to struggle with drug and alcohol abuse (27, 28).

This study also indicated increased unemployment among people with and without mental health problems following the 2008 recession. Our results are in line with previous studies, both from Europe (76, 81, 84-86) and the USA (82,

86) reporting increased unemployment among the general population as an effect of the 2008 recession. These previous studies did not however, investigate people with and without mental health problems separately.

With regard to sociodemographic factors, we found that the risk of unemployment was more pronounced among younger people in the group with mental health problems. This trend was reversed for the group without mental health problems where the risk of unemployment was more pronounced for older people.

With regard to age the risk of unemployment following the 2008 recession was more pronounced in younger people for the group with mental health problems. This finding is in line with studies by Evans-Lacko and colleagues and Starace and colleagues (13, 15). A study from Sweden has shown that young people were at most risk of being unemployed (104) but importantly this study was based on the general population and not on people with mental health problems. The reason why younger people with mental health problems are more at risk of being unemployed might lie in the argument that young people are less experienced and might therefore produce less so companies prefer older and more experienced workers when times gets hard such as during the 2008 recession (105). Among people without mental health problems, the risk of unemployment was more pronounced among older people however this result was not in line with other studies, which reported a higher risk of unemployment among younger people (13, 15, 104).

When estimating the risk of unemployment for people with mental health problems compared to those without, there was a significantly greater risk for people with mental health problems for all three years. The risk was greatest in 2012. This points to an increasing gap between unemployment of people with and without mental health problems. Studies by Evans-Lacko and colleagues and Starace and colleagues investigated the difference in employment rate among people with regard to whether they had mental health problems or not. They also found a gap in the employment rate between those groups, which increased during the recession (13, 15). Evans-Lacko and colleagues found in their study that living in a country where attitudes towards people with mental health problems were negative, meant an increased likelihood of unemployment for

people with mental health problems (13). People with mental health problems often have to face discrimination and deal with social exclusion (25). One study found that attitudes towards people with mental health problems hardened during a recession (13). This might be the reason for the increased unemployment gap between people with and without mental health problems during the 2008 recession.

Strengths and limitations:

This study is based on a large, prospective cohort, assessing the health of the general population at three different time points 2007, 2009 and 2012, providing an opportunity to observe the impact of the economic collapse in 2008 on mental well-being, perceived stress and unemployment.

However our study is limited by a fairly small group of participants with mental health problems (n=576 in 2007, n=367 in 2009 and n=612 in 2012), possibly affecting the study findings and the generalizability of our results.

In addition the study sample group with mental health problems group was defined by their answers to three questions asked in the *Health and WellBeing* survey about chronic anxiety/tension, depression and other mental health problems. The study cohort was determined by how these questions were answered each year and it was not possible to analyze whether the same individuals answered these questions in the same way each year.

Finally, these three questions did not contain information about the severity or duration of mental health problems. Neither was it possible to analyze other mental health problem in the third question, nor the severity or the type of mental health problems.

Conclusion

Similar proportions of people with mental health problems had poor mental well-being and high perceived stress regardless of the economic situation while people without mental health problems showed poorer mental well-being and higher perceived stress during and after the 2008 recession. There was an

increased risk of unemployment in both groups of people with and without mental health problems but the risk was greater among people with mental health problems compared to people without mental health problems.

This study indicates that unemployment (as an effect of the 2008 recession) might not have been the most significant stress factor for people with mental health problems during the 2008 recession. The most dominant stress factors before, during and after the economic collapse might be a topic for future research.

The gap in unemployment between people with and without mental health problems needs to be taken into consideration and it is important to focus on reducing this gap and to ensure that people with mental health problems receive equal opportunities in the labor market.

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Table 1: ***All participants in study of Health and Well-Being of Icelanders, years 2007, 2009 and 2012, stratified by gender, residency and employment status and according to mental well-being (MWB) and perceived stress (PS) of the $SWEMWBS^1$ and $PSS-4^2$***

	People with mental health problems				**People without mental health problems**			
Year	2007	2009	2012	p value*	2007	2009	2012	p value
Total	576	367	612		2922	2006	3216	
Sex (%)								
Men	228(39.6)	145 (39.5)	215 (35.1)	0.213	1425 (48.9)	986 (49.2)	1577 (49.1)	0.973
Women	348 (60.4)	222(60.5)	397 (64.9)		1491 (51.1)	1020 (50.8)	1633 (50.9)	
Missing values	0	0	0		6	0	6	
Mean age (SD)	44.56 (14.25)	46.44 (12.88)	46.31 (13.27)	0.041*	45.11 (14.54)	47.90 (13.07)	48.23 (13.54)	<0.001***
Residency								
Urban (%)	269 (47.4)	159 (43.8)	285 (47.2)	0.511	1373(47.6)	921 (46.6)	1547 (48.6)	0.387
Rural (%)	299 (52.6)	204 (56.2)	319 (52.8)		1514(52.4)	1055(53.4)	1639 (51.4)	
Missing values	8	4	8		33	30	30	
Employment status								
Employed (%)	336 (58.3)	212 (57.8)	363 (59.3)		2353 (80.5)	1640 (81.8)	2696 (83.8)	
Unemployed (%)	14 (2.4)	26 (7.1)	48 (7.8)	0.003**	38 (1.3)	68 (3.4)	74 (2.3)	<0.001***
Studying (%)	14 (2.4)	10 (2.7)	10 (1.6)		90 (3.1)	57 (2.8)	77 (2.4)	
Disabled (%)	140 (24.3)	86 (23.4)	134 (21.9)		113 (3.9)	73(3.6)	141 (4.4)	
Others (%)	72 (12.5)	33 (9.0)	57 (9.3)		328 (11.2)	168 (8.4)	228 (7.1)	
Missing values	0	0	0		0	0	0	
SWEMWBS								
Higher MWB (%)	352 (65.1)	235 (66.0)	375 (63.8)	0.773	2761 (97.4)	1873 (96.2)	3012 (96.4)	0.036*
Lower MWB (%)	189 (35.0)	121 (34.0)	213 (36.2)		74 (2.6)	73 (3.8)	114 (3.6)	
PSS-4								
Low PS (%)	338 (60.0)	212 (58.7)	360 (60.1)	0.902	2757 (97.0)	1873 (95.8)	2999 (95.8)	0.025*
High PS (%)	225 (40.0)	149 (41.3)	239 (39.9)		86 (3.0)	83 (4.2)	133 (4.2)	

1: SWEMWBS: short Warwick-Edinburgh Mental Well-Being Scale. 2: PSS-4: four items Perceived Stress Scale
**Significant at p< 0.05 level. **Significant at p<0.01 level. ***Significant at p<0.001 level*

**Chi square test was used to assess statistical significance with p<0.05 indicating statistical significance*

Table 2:Crude and adjusted odds ratio for the risk of low well-being according to SWEMWBS for 2009 and 2012, compared with 2007 for participants with and without mental problems in the study of Health and Well-Being of Icelanders.

	Group with mental health problems			Group without mental health problems		
	n/n	**Crude OR (95% CI)**	**Adjusted OR (95% CI)**	**n/n**	**Crude OR**	**Adjusted OR**
2007	553/1488	1 (ref)	1 (ref)	2841/7927	1 (ref)	1 (ref)
2009	357/1488	0.96 (0.72,1.27)	0.98 (0.73,1.31)	1952/7927	1.45 (1.05, 2.02)	1.66 (1.18, 2.35)
2012	588/1488	1.06 (0.83,1.35)	1.12 (0.86,1.44)	3134/7927	1.41 (1.05, 1.91)	1.64 (1.20, 2.26)
Men	562/1488			3876/7927		
2007	217/562	1 (ref)	1 (ref)	1389/3876	1 (ref)	1 (ref)
2009	142/562	1.03 (0.66,1.59)	1.03 (0.65,1.63)	958/3876	1.26 (0.78, 2.04)	1.44 (0.86, 2.39)
2012	203/562	0.94 (0.63,1.40)	1.01 (0.66,1.53)	1529/3876	1.49 (0.99, 2.28)	1.72 (1.11, 2.71)
Women	926/1488			4041/7927		
2007	326/926	1 (ref)	1 (ref)	1447/4041	1 (ref)	1 (ref)
2009	215/926	0.91 (0.63,1.32)	0.94 (0.64,1.38)	994/4041	1.64 (1.04,2.59)	1.87 (1.17, 3.00)
2012	326/926	1.14 (0.84,1.56)	1.17 (0.85,1.62)	1600/4041	1.33 (0.88, 2.05)	1.56 (1.00, 2.46)
Age groups						
18-39 years	518/1488			2389/7927		
2007	209/518	1 (ref)		1009/2389	1 (ref)	
2009	122/518	0.86 (0.54,1.35)	0.85 (0.53,1.35)	553/2389	2.16 (1.37, 3.44)	2.02 (1.27, 3.23)
2012	187/518	1.15 (0.77,1.71)	1.15 (0.76,1.73)	827/2389	1.85 (1.21,2.88)	1.74 (1.13, 2.71)
40-69 years	952/1488			5300/7927		
2007	321/952	1 (ref)		1708/5300	1 (ref)	
2009	234/952	1.09	1.07	1373/5300	1.34	1.32

		(0.76,1.58)	(0.73,1.55)		(0.81,2.22)	(0.79,2.22)
2012	397/952	1.07	1.11	2219/5300	1.50	1.52
		(0.78,1.58)	(0.80,1.55)		(0.97,2.37)	(0.97,2.42)

**Adjusted for employment status and residency.*
SWEMWBS: short Warwick-Edinburgh Mental Well-Being Scale

Table 3:Crude and adjusted odds ratio for the risk of high perceived stress according to PSS-4 for 2009 and 2012, compared with 2007 for participants with and without mental problems in the study of Health and Well-Being of Icelanders.

	People with mental health problems			**People without mental health problems**		
	n/n	**Crude OR (95% CI)**	**Adjusted OR (95% CI)**	**n/n**	**Crude OR**	**Adjusted OR**
2007	563/1523	1 (ref)	1 (ref)	2843/7931	1 (ref)	1 (ref)
2009	361/1523	1.06 (0.81,1.38)	1.07 (0.81,1.41)	1956/7931	1.42 (1.04,1.93)	1.48 (1.07,2.03)
2012	599/1523	1.00 (0.79,1.26)	1.00 (0.78,1.28)	3132/7931	1.42 (1.08,1.88)	1.53 (1.15,2.04)
Men	579/1523			3903/7931		
2007	226/579	1 (ref)	1 (ref)	1392/3903	1 (ref)	1 (ref)
2009	143/579	0.86 (0.56,1.33)	0.85 (0.54,1.33)	966/3903	1.46 (0.91,2.34)	1.37 (0.84,2.22)
2012	210/579	0.77 (0.52,1.14)	0.80 (0.53,1.20)	1545/3903	1.39 (0.91,2.15)	1.36 (0.88,2.13)
Women	944/1523			4019/7931		
2007	337/944	1 (ref)	1 (ref)	1447/4019	1 (ref)	1 (ref)
2009	218/944	1.20 (0.85,1.69)	1.23 (0.86,1.76)	990/4019	1.45 (0.96,2.19)	1.54 (1.01,2.35)
2012	389/944	1.14 (0.85,1.53)	1.14 (0.84,1.56)	1582/4019	1.51 (1.05,2.19)	1.66 (1.14,2.44)
Agegroups						
18-39 years	522/1523			2374/7931		
2007	211/522	1 (ref)		1001/2374	1 (ref)	
2009	122/522	0.95 (0.61,1.49)	0.91 (0.57,1.44)	552/2374	1.54 (0.99,2.39)	1.40 (0.90,2.19)

2012	189/522	0.83	0.79	821/2374	1.89	1.80
		(0.56,1.23)	(0.52,1.18)		(1.30,2.79)	(1.23,2.65)
40-69 years	997/1523			5318/7931		
2007	334/997	1		1718/5318	1	
		(ref)			(ref)	
2009	237/997	1.15	1.18	1377/5318	1.55	1.52
		(0.81,1.63)	(0.83,1.68)		(0.99,2.45)	(0.96,2.41)
2012	406/997	1.14	1.17	2223/5318	1.31	1.29
		(0.84,1.54)	(0.86,1.60)		(0.86,2.02)	(0.85,1.99)

**Adjusted for employment status and residency*
PSS-4: Four items Perceived Stress Scale

Table 4:Crude and adjusted odds ratio for the risk of unemployment in 2009 and 2012, compared with 2007 for participants with and without mental problems in the study of Health and Well-Being of Icelanders.

	People with mental health problems			**People without mental health problems**		
	n/n	**Crude OR (95% CI)**	**Adjusted OR (95% CI)**	**n/n**	**Crude OR**	**Adjusted OR**
2007	364/1033	1	1	2481/7093	1	1
		(ref)	(ref)		(ref)	(ref)
2009	248/1033	2.93	3.55	1765/7093	2.56	4.08
		(1.52,5.88)	(1.78, 7.46)		(1.73, 3.88)	(2.61, 6.57)
2012	421/1033	3.22	3.95	2847/7093	1.72	2.56
		(1.79,6.15)	(2.12, 7.95)		(1.16, 2.57)	(1.64, 4.12)
Men	430/1033			3650/7093		
2007	165/430	1	1	1279/3650	1	1
		(ref)	(ref)		(ref)	(ref)
2009	104/430	6.26	9.38	912/3650	2.80	4.60
		(2.17,22.60)	(2.94,41.82)		(1.59, 5.07)	(2.42, 9.35)
2012	161/430	5.71	8.40	1459/3650	1.77	2.49
		(2.10,19.98)	(2.77,36.49)		(1.02, 3.20)	(1.29, 5.09)
Women	603/1033			3434/7093		
2007	199/603	1	1	1197/3434	1	1
		(ref)	(ref)		(ref)	(ref)
2009	144/603	1.72	1.88	853/3434	2.37	3.63
		(0.72, 4.18)	(0.77, 4.74)		(1.36, 4.22)	(1.96, 7.06)
2012	260/603	2.28	2.58	1384/3434	1.66	2.60
		(1.11, 5.05)	(1.22, 5.96)		(0.97, 2.92)	(1.42, 5.01)

Agegroups						
18-39 years	405/1033			2111/3434		
2007	160/405			891/2111		
2009	98/405	5.60	5.67	486/2111	2.97	2.93
		(2.09,17.72)	(2.10,18.04)		(1.68, 5.34)	(1.66, 5.27)
2012	147/405	5.75	5.82	734/2111	2.05	2.03
		(2.29,17.51)	(2.31,17.82)		(1.18, 3.66)	(1.16, 3.63)
40-69 years	614/1033			4791/3434		
2007	196/614	1		1501/4791	1	
		(ref)			(ref)	
2009	149/614	2.15	2.22	1261/4791	7.53	7.46
		(0.83, 5.98)	(0.85, 6.18)		(3.41,19.91)	(3.37,19.74)
2012	269/614	2.64	2.69	2029/4791	4.25	4.19
		(1.17, 6.77)	(1.19,6.90)		(1.91,11.26)	(1.89,11.12)

**Adjusted for residency*

Table 5:Crude and adjusted odds ratio for the risk of unemployment in 2007, 2009 and 2012 for participants with mental problems compared to people without mental health problems in the study of Health and Well-Being of Icelanders.

	People without mental health problems			**People with mental health problems**		
	n/n	**Crude OR**	**Adjusted OR**	**n/n**	**Crude OR (95% CI)**	**Adjusted OR (95% CI)**
2007	2481/7093	1 (ref)	1 (ref)	364/1033	2.57 (1.33,4.68)	2.84 (1.36,5.60)
2009	1765/7093	1 (ref)	1 (ref)	248/1033	2.57 (1.79,4.64)	2.81 (1.71,4.50)
2012	2847/7093	1 (ref)	1 (ref)	421/1033	4.82 (3.28,7.02)	4.78 (3.20,4.08)
Men	3650/7093			430/1033		
2007	1279/3650	1 (ref)	1 (ref)	165/430	1.74 (0.50,4.73)	1.86 (0.42,5.98)
2009	912/3650	1 (ref)	1 (ref)	104/430	3.90 (1.96,7.37)	4.09 (2.04,7.83)
2012	1459/3650	1 (ref)	1 (ref)	161/430	5.61 (3.11,9.85)	6.45 (3.51,11.67)
Women	3434/7093			603/1033		
2007	1197/3434	1 (ref)	1 (ref)	199/603	3.11 (1.38,6.61)	3.53 (1.44,8.24)
2009	853/3434	1 (ref)	1 (ref)	144/603	2.26 (1.10,4.37)	1.92 (0.92,3.78)
2012	1384/3434	1 (ref)	1 (ref)	260/603	4.27 (2.55,7.08)	3.80 (2.23,6.39)
Agegroups				**n/n**		
18-39 years	2111/7093			405/1033		
2007	891/2111	1 (ref)	1 (ref)	160/405	1.40 (0.46,3.53)	1.35 (0.44,3.39)

2009	486/2111	1 (ref)	1 (ref)	98/405	2.65 (1.34,5.06)	2.75 (1.38,5.32)
2012	734/2111	1 (ref)	1 (ref)	147/405	3.94 (2.22,6.91)	3.87 (2.16,6.87)
40-69	4791/7093			614/1033		
years						
2007	1501/4791	1 (ref)	1 (ref)	196/614	9.23 (3.04,28.94)	9.03 (2.97,28.36)
2009	1261/4791	1 (ref)	1 (ref)	149/614	2.64 (1.26,5.12)	2.83 (1.34,5.54)
2012	2029/4791	1 (ref)	1 (ref)	269/614	5.75 (3.32,9.81)	5.85 (3.37,10.01)