



The Connection Between Depression And Chronic Pain. A Cross-Sectional Study For Individuals With Chronic Pain In Hail Region

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Abstract: Chronic pain is a physical disorder and a critical factor in determining depression. Their synchronicity tends to worsen the risk of both disorders. The research to date has found little information about the relationship between them. This research aimed to provide new insights into the understanding of the relationship between chronic pain and depression among the residents of Hail city, to free patients from chronic pain-induced depression. Statistical data in this paper confirmed that more than half of patients with pain also suffer from depression or mood swings. Data were collected with an online, semistructured questionnaire; the obtained data were converted into statistical data using Microsoft Excel 2013. It was found that women are more likely than men to develop depression due to chronic pain. The main cause of depression in patients was a chronic headache, colitis, and rheumatoid arthritis respectively, and it was found that the most commonly used pain relief medications were NSAIDs and painkillers & on the other hand, the most frequently used antidepressants were selective serotonin reuptake inhibitors. According to our findings, the type of chronic disease and its link to the patient's gender, education level, and the type of pain relief drug taken are the major elements that determined this association. We must also remember the patient's extensive medical history with a chronic pain condition, which played a significant influence among our patients who took part in our survey. Moreover, it was noticed that most patients received adequate information from the pharmacist about their antidepressant medication. Finally, depression still ranks high as a major factor affecting an individual's life in general; therefore, this research could promote the identification of new causes and targets for chronic pain-induced depression.

Keywords: Depression, Chronic pain, Cross-sectional study, Semi-structured online questionnaire, Hail city.

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I. INTRODUCTION

Pain happens when something harms a living body, causing an uncomfortable or unpleasant feeling. The current International Association for the Study of Pain (IASP) defined pain as "An unpleasant sensation that can range from mild, localized discomfort to agony".¹ However, pain may continue and cannot be treated successfully; then, Chronic pain may be defined as pain that persists for more than three months.² There are various types of pain but the most common are acute pain, which starts suddenly and lasts for short periods, and chronic pain, which is defined as pain which lasts for at least twelve weeks.³ The chronic type of pain can continue, even after an injury heals. Pain signals can remain active in the nervous system for weeks, months, or years. Some people suffer from chronic pain even when there is no past injury or apparent body damage. The causes and severity of chronic pain can differ widely. There are common diseases, which can cause chronic pain such as headaches and migraine, myocardial infarction, rheumatoid arthritis, osteoarthritis, dyslipidemia, kidney disease, cerebral vascular disease, peripheral vascular disease, inflammatory bowel disease, neuropathy, cancer, cerebrovascular accident (CVA), and others.⁴ Depression is more common in chronic pain patients than in healthy controls as a consequence of the presence of chronic pain.⁵ Depression (a major depressive disorder) is a common and serious medical illness, which negatively affects how you feel, the way you think, and how you act. Depression comprises four main types: major depression, persistent depressive disorder, seasonal affective disorder, and bipolar disorder.⁶ Physical pain and depression have a deeper biological connection than simple cause and effect; the neurotransmitters which influence both pain and mood are serotonin and norepinephrine.⁷ Based on this empirical knowledge, depression associated with a chronic medical illness often aggravate the condition, especially if the illness causes pain and fatigue, or limits a person's ability to interact with others. Several factors, which can play a role in depression, include biochemical, differences in particular chemicals in the brain that might contribute to symptoms of depression, and genetic depression can run in families. Moreover, one in six people (16.6%) will experience depression at some time in their life.⁸ Depression causes feelings of sadness and/or a loss of interest in activities once enjoyed. It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at work and home. Depression can strike at any time, but on average, it first appears during the late teens to mid-20s. Patients suffering from chronic pain-induced depression show a weaker assessment than those with chronic pain only; chronic pain and depression are closely correlated in terms of appearance and spread and can commonly promote their severity progress.⁹ In this study, we further explored the relationship between chronic pain and depression in a specific community sample. More specifically, we determined the diseases responsible for pain, symptoms of depression, the degree of association between chronic painful physical condition and symptoms of depression. Till date, neither the factors causing chronic pain and its relationship to depression

nor their interrelationships have been fully understood, which poses a major challenge to the treatment of depressive pain. However, in recent years, studies have revealed great interest in this research. Therefore, this article may provide a new vision into the understanding of the connection between chronic pain and depression to assist patients in achieving higher levels of life satisfaction and pain control.

2. METHODOLOGY

This cross-sectional study was conducted online for patients with depression due to chronic pain who had already been diagnosed and had visited clinics in Hail hospitals for this purpose between January and March 2020. Data were collected through the online responses to a questionnaire especially devised for this investigation containing demographic data (age, gender, education level) and information about the drugs used (type, frequency, time of use, and quantity). Patients who were depressed due to chronic pain and who visited the clinics in Hail Hospitals for this purpose or those who developed depressive symptoms as a result of chronic pain, patients of either gender and 18 years of age or greater were included in the study. The exclusion criteria for the present study were depression for reasons other than chronic pain or unstable diseases (recent aggravation). Frequency and percentages (with 95% confidence intervals) were reported for all responses. The Research Ethics Committee of the University of Hail, (Reference No. 140) approved the study concerning scientific content and compliance with applicable online study.

3. RESULTS

To understand the connection between depression and chronic pain and finding appropriate solutions, data were collected from the recruited 103 patients who had already been diagnosed with depression due to chronic pain and had visited clinics in Hail hospitals for this purpose. Analysis of the data was performed using Excel-2013. The results were as follows.

4. STATISTICAL ANALYSIS

Data was collected by using a preformed questionnaire online (A questionnaire with patient's consent for this study was included in the supplemental data). Data entry and coding were carried out using Microsoft Excel 2013 software. Mean, standard deviations, and percentages were calculated. Descriptive statistics are applied in the form of frequency and percentage for categorical variables. The sample size was calculated using the online tool Raosoft® sample size calculator using a 5% margin of error a confidence level of 95%, a population size of 400,0006, and a response rate of 50%: the estimated sample size was 197 (Raosoft Sample Size Calculator).¹⁰ This was the sample size which we had expected to reach according to the population of Hail city, but we were able to recruit only 103 respondents.

Table 1: Demographic characteristics of the patients participating in the study		
	Number	Frequency
Total number of patients		103
Gender		
Male	24	23.3%
Female	79	76.7%
Age in years (Mean $\pm$ SD)*		31.9 $\pm$ 9.2
20-60	100	97.1%
>60	3	2.9%
Education		
School diploma- holders	7	6.7%
High school diploma- holders	22	21.4%
Bachelor's degree holders	66	64.1%
Master's degree or Ph.D. holders	3	2.9%
Uneducated	5	4.9%

*Values are mean $\pm$ SD; (n=103). p value < 0.001.

Of 103 patients who participated in the present study, 23.3% were male and 76.7% were female patients diagnosed with depression due to chronic pain. Of the 103 participants, 52.4% were in the age group 20-29 years, and 44.7% were in the age group 30- $\leq$ 60 years: only 2.9% were elderly (over 60 years). The mean age was 31.94 $\pm$ 9.22. In addition, 4.9% of the participants were uneducated, 21.4% were high school diploma-holders, 64.1% held bachelor's degrees and only 2.9% held either a Master's degree or a Ph.D. (see Table 1).

Table 2: Evaluation of the medical history of the patients participating in the study							
		Frequency	Percent				
The first diagnosis of depression	Less than a year ago	35	34.0	Anti-depressant drugs used by the patients	A	51	49
	1-5 years ago	41	39.8		B	5	5
	5-10 years ago	14	13.6		C	10	10
	10-15 years ago	7	6.8		D*	37	36
	More than 15 years ago	6	5.8				
	Total	103	100.0			103	100

*Although they were depressed.

- A: Selective serotonin reuptake inhibitors
B: Tricyclic antidepressants
C: Benzodiazepine
D: No treatments were taken

Of the 103 patients who participated in the study, 34% had been first diagnosed with depression due to chronic pain in the previous year, 39.8 % had been first diagnosed within one to five years, and 5.8 % had started to be diagnosed more than fifteen years before. In addition, it was found that the

most frequently used antidepressant drugs by the patients were selective serotonin reuptake inhibitors (used by 49%), benzodiazepine (10%), and tricyclic antidepressants (5%), whereas 36% did not take any medication for depression even though they did suffer from it (see Table 2).

Table 3: Depression complications among the patients* participating in the study						
		Frequency	Percent			
Does depression cause complications				Type of Complication	Frequency	Percent
	Yes	56	54.4	Drowsiness	15	14.5
	No	47	45.6	Stress and anxiety	53	51.5
	Total	103	100.0	Severe depression at being overweight	35	34
				Total	103	100.0

*The patients participating in the study (n = 103).

Most of the participants had suffered from depression complications due to chronic pain, which varied from drowsiness, stress, and anxiety to severe depression at being overweight. (see Table 3).

Table 4: Diseases that caused chronic pain among the patients

Table 11: Diseases that caused chronic pain among the patients							
		Frequency	Percent	Pain-relievers was taken by the participants	Types of Pain-Reliever	Frequency	Percent
*Diseases causing chronic pain	Kidney disease	23	22.3		NSAIDs and painkillers	73	71
	Nervous system diseases	8	7.8		*Anti- depressants	14	14
	Chronic headache	19	18.4		Stomach acid reducers and drugs for ulcerative colitis	16	15
	Rheumatoid arthritis	21	20.4				
	Heart attack	11	10.7				
	Colon and rectal disorders	19	18.5				
	Cancer	2	1.9				
	Total	103	100.0		Total	103	100.0

*Many research studies showed the same results.¹¹

**They generally experienced moderate pain relief from antidepressants.

The most frequent diseases, which had caused chronic pain and led to the patients becoming depressed, were chronic headache, colon, and rectal disorders, rheumatoid arthritis, nervous system diseases, kidney disorders, heart attack, and cancer. On the other hand, it was found that the types of pain-

reliever, which they had used to relieve chronic pain, the most frequently used were NSAIDs and painkillers (used by 71%), antidepressants (by 14%), and a stomach acid reducer, and drugs for ulcerative colitis (15%) (See Table 4)¹¹.

Table 5: Experience of the pharmacist rule

Table of Experience of the pharmacist							
		Frequency	Percent	Did the pharmacist explain to you all the information related to the prescribed medicines?	Frequency		Percent
How long did the pharmacist take to dispense the medicine?	In the requested time	71	68.9		Yes	63	61.2
	Less than required	16	15.5		No	39	37.9
	More than required	16	15.5				
	Total	103	100.0		Total	103	100.0

Note: The average dispensing time was 1.86 minutes in pharmacies and 1.7 minutes in rural drug-selling shops.¹²

To ensure that the medicines prescribed to patients are appropriate to their circumstances, advising patients about medicines, including how to take them, what reactions might occur, and answering patients' questions is of great consequence, and particularly so with chronic pain and patients with depression. The findings showed that 68.9% of the respondents reported that the pharmacist had complied with the time required to produce a prescription following a patient's request. Furthermore, the majority of the pharmacists were found to have dispensed the medications and given sufficient and necessary information about them to 61.2% of the participants. (See Table 5).

5. DISCUSSION

Chronic pain is one of the essential components of depression determination and their association will generally

increase the risk for both illnesses. Unfortunately, their association remains unclear, which leaves an unsolved problem for controlling chronic pain-induced depression. In this study, we, therefore, sought to provide new insights into the understanding of the association between chronic pain and depression among patients in Hail city. The findings showed that depression is more prevalent in women; the same finding has been made by many previous studies.^{13,14} The results also showed that depression resulting from pain was prevalent among different age groups, and the findings also support those of some studies which found that there is a relationship between depression resulting from pain and educational level, as most of the cases reported in this study were among university-level learners (holders of a bachelor's degree).¹⁵ Recent research had pointed to an increase in the prevalence of depression, especially among adults, and the findings of the current study support this. The trend for the

spread of depression among adults can be ascribed to several reasons, including the fast lifestyle which people have today, work-related stress, and the spread of viral diseases such as the coronavirus¹⁶⁻¹⁸ which has had a great impact on the emergence of many cases of depression among young adults. Rapid lifestyles which include smoking, excessive use of digital media, excessive alcohol consumption, and obesity all hurt public health and public health services and increase the incidence of diseases that appear as a consequence of this lifestyle, such as chronic headache, repetitive strain injury, fibromyalgia, nerve damage, cancer, acid reflux, and ulcers. Thus in younger patients, chronic pain can result in restricted activity in everyday life and this might prolong into old age.¹⁹ In addition, chronic pain in younger patients decreases life enjoyment which can potentially lead to more dangerous problems.²⁰⁻²¹ The fact that increased prevalence of depression among adults was not only mentioned in this research but was mentioned and supported in many recent pieces of research.²² The patients who participated in the present study were suffering from depression because of the chronic pain that they suffered from and their depressions were manifested in several forms, including nausea, addiction, severe depression, overweight, stress, and anxiety. In addition, most of the study participants were suffering from chronic pain resulting from chronic headache, colon and rectal disorders, rheumatoid arthritis, nervous system diseases, kidney disorders, heart attack, and cancer. These diseases have been identified in many previous studies as being responsible for chronic pain and depression in people who suffer from them.²³ Most of the patients in this study had used NSAIDs and painkillers¹¹, antidepressants, stomach acid reducers, and drugs for ulcerative colitis to control the symptoms of their chronic pain. Based on the classes of antidepressant drugs used by patients who have chronic pain, the findings showed that the most frequently used was escitalopram, a selective serotonin reuptake inhibitor. The use of selective serotonin reuptake inhibitors has been reported in several previous studies.²⁴ Previous findings have shown the advantages of the use of antidepressants in the handling of chronic pain in adults, and when they are used for the relief of chronic pain their aim is most often as adjuvant analgesics, which means that they are prescribed along with other pain medications rather than used alone as the main pain treatment.²⁵ The findings of the current study showed that the participants generally experienced moderate pain relief from the use of antidepressants. Furthermore, to evaluate the involvement of pharmacists in medical care, the current study investigated drug dispensing and the provision of appropriate instructions by pharmacists because this is essential when dispensing antidepressants and the results showed that the participant patients had received adequate information from the pharmacist about their medications.²⁶

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Most of the pharmacists had dispensed the ordered medications and provided the necessary information about them. In addition, most of the pharmacists had complied with the time required to produce a prescription following a patient's request. Finally, when people have depression and chronic pain, they typically only talk about the physical symptoms, which means they are not getting treatment for their mental health issues. It's also critical to diagnose and treat symptoms that indicate depression or anxiety²⁷⁻²⁸, to help patients to achieve higher life satisfaction and pain management.

6. CONCLUSION

Many of us can experience depression caused by pain, but those who suffer from chronic pain can undergo considerably more and this needs more attention. Depression and chronic pain are related to each other and the phenomenon can be analyzed by knowing many factors surrounding a patient's life, such as demographic factors, risk factors, lifestyle, and associated cognitive factors in patients with depression due to chronic pain. Therefore, the important factors that determined this relationship according to our results are the type of chronic disease and its relationship to the patient's gender, education level, and the type of drug used for pain relief, with the identification of the most effective drug. We also cannot forget the long medical history of the patient with chronic pain disease, which also played a considerable role among our patients who participated in this survey. Educating the public about cognitive support treatment as a way to stop depression should be a priority. Furthermore, potential changes of lifestyle urgently need to be made with focusing on consultation of patients who are not giving themselves the best chance of a healthy life can help to achieve the desired health outcomes.

7. AUTHORS CONTRIBUTION STATEMENT

Assistant. Prof. Dr. Weiam Hussein, the principal investigator on this work, has contributed to data analysis, processing, interpretation of the results, and the design of the manuscript. Assistant. Prof. Dr. Fawaz Alheibshy presented the research guide with valuable input and suggestions. Assistant. Prof. Dr. Farhan Al-Shammari guided the successful completion of this work and commented on the manuscript while writing. All the authors read and approved the final version of the manuscript.

8. CONFLICT OF INTEREST

Conflict of interest declared none.

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