SMOKING CESSATION AND DEPRESSION IN MALE SAUDI SMOKERS

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Master's Dissertation to obtain the Master's Degree in Primary Care Mental Health

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ABSTRACT

This study looks at the relationship between smoking cessation and depression in Saudi male smokers. The study has found that there is a positive correlation between quitting smoking and decreasing the intensity of depression, as people who participated in this program had a higher chance to decrease their level of depression in comparison with those who did not. We highly recommend this program for people who want to quit their smoking habits and enjoy their lives.

After conducting this study on 75 Saudi men, only 11 quit smoking, and 64 either reduced smoking, didn't change, or smoked more. Before the clinical help, 30 of those participants had no depression, 33 had minimal depression, 10 had mild depression, and 2 had moderate depression. After 6 months, and after attending the smoke cessation clinic, 51 smokers had no depression, while 12 has minimal depression, 8 had mild depression, and 4 had moderate depression. This shows that effectively, smoking has a relationship to depression, as lots of smokers who quit (or reduced) smoking have lost or reduced depressive symptoms.

- 30 of the 75 participants who started the process to quit smoking had no depression. After 6 months, 51 of the 75 participants had no more depression, as the process to quit has helped them significantly.
- 33 participants had minimal depression before starting the process to quit. After 6 months, this number decreased significantly, and only 12 participants had mild depression, showing more of the positive effects of quitting.
- The 10 participants that had mild depression decreased as well, to 8 participants, showing more of the positive effects of quitting.
- 2 participants who had moderate depression however, increased to 4, due to the external stressors preventing them from becoming emotionally stable.

Conclusion: we have found that Smoking Cessation Clinic has a positive effect on 58% of the participants, as 44% of them decreased smoking habits, 14% completely quit. However, we have found out that according to the study, the process of smoking cessation helped many of the minimally depressed, not the mild nor moderately depressed.

Key words: Smoking, Smoking Cessation, depression, PHQ9.

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LIST OF ACRONYMS

ADD	Any Depressive Disorder
AIMS	Assessment Instrument for Mental Health Systems
DSM	Diagnostic and Statistical Manual
ICD 10	International Statistical Classification of Disease 10
MDD	Major Depressive Disorder
MH	Mental Health
MOH	Ministry of Health
PHQ-9	Patient Health Questionnaire 9
WHO	World Health Organization

1. INTRODUCTION

“Depression is an illness characterized by persistent sadness and a loss of interest in daily activities that normal people usually enjoy, for at least two weeks” According DSM IV Criteria for Major Depressive Disorder (MMD).Depression is a common mental disorder that affects people of all ages, anywhere around the globe along their life and it is the leading cause of ill health and disability worldwide. The World Health Organization (WHO) reported that by 2017 more than 300 million people are now living with depression, an increase of more than 18% between 2005 and 2015. [1].

It is a renowned statistic that cigarette smoking is much more common among the patients with psychiatric diseases for a number of reasons. [2].

People who suffer from depression are twice as likely to smoke. [3].

The tobacco epidemic is one of the biggest public health threats the world has ever faced, killing more than 7 million people a year. [1].Smoking is the most important, and preventable health risk in the developed world, and is an important cause of death worldwide. [4].However, it was stated that the cessation is quite difficult to perform due to smokers’ psychological addiction. [5].

It is controversial whether smoke cessation has a positive or a negative impact on depression. Some claim that Smoking quitting frequently leads to depression which could be a reason for the relapse. [6]. On the other hand, other scientists believe that smoking cessation leads to mental health improvement in anxiety, depression, mixed anxiety and depression, and stress which significantly decreased between base line and follow up in quitters compared with continuing smoker. [5].

This researcher observed the relationship between the research variables and drew relevant conclusions regarding depression outcomes in both patients who went through the whole 6 months of the smoking cessation clinic, before and after quitting.

2. LITERATURE REVIEW

2.1 Linkage between smoking cessation and depression

Cigarette smoking is a dangerous habit which leads to early death of smokers. Smoking is a responsible for five million deaths a year. [5].Besides, it is widely known that people spend an enormous amount of money on cigarettes. Therefore, a lot of people have an intention to quit smoking. However, it was stated that the cessation is quite difficult to perform due to smokers' psychological addiction. [6].

It is a renowned statistic that cigarette smoking is much more common among the patients with psychiatric diseases for a number of reasons which may include (but are not limited to) psychological implications and neurobiological mechanisms. The addiction to nicotine is often associated with co-occurring psychological ailments and is known to increase the risk of being exposed to mortality, different types of injuries, and devastating influence of the combination of smoking and depression on the smokers' lives. [2].

In 2014 a study discussed the outcomes of depression during the lifetime and smoking cessation. They believed that the process of smoking cessation seriously impacted the outlooks of depressed patients and these two activities could interfere with each other on a psychosocial level. The researchers conducted study intended to assess the contributions of disinterest and depressed mood to the development of depression and its subsequent outcomes. The results of the study showed that depressed mood and smoking cessation activity were interconnected in 95% of the cases. Regardless, the outcomes of depression could not be predicted solely on this data. They concluded that we should pay more attention to anhedonia instead of trying to associate smoking cessation and depression-quitting smoking with the outcomes of depression. [7].

Other researchers also investigated the issues of connecting depression to the process of smoking cessation. They wanted to validate the thesis statement that claimed that people suffering from depression were more susceptible to being exposed to the aggravated symptoms of depression. The results of the study suggested that there were no particular changes in patients' mental health during or after the process of smoking cessation. [8].The researchers did not find any sign of intensified symptoms of depression and concluded that the outcomes of depression did not differ between the two types (smoking cessation and depression-quitting smoking) of patients. Therefore, the findings of this particular research support the findings that were presented by other researchers in the area because smoking did not bear a mediating connotation in the relationship between smoking cessation and the outcomes of depression. Additionally a study was conducted on the topic by and sufficiently addressed the issue of the interconnection between smoking and the symptoms of depression. The findings of the study showed that even though a relatively high number of individuals smoked with the intention of weakening their depression symptoms, the effect was insignificant. The process of smoking cessation did not trigger any variance in research results as well

because no connections were found between depression-quitting smoking and the outcomes of depression. [9].

2.2 Negative impact of smoking cessation on depression:

The connection between tobacco use and mental health is not entirely clear. [5].The apparent comorbidity between cigarette smoking and depression may be explained in at least two ways. First, it could be argued that both smoking and depression are caused by common underlying genetic and environmental factors. Second, it could also be argued that cigarette smoking and depression are related in a causal manner, such that either: depression increases the risks of smoking; or smoking increases the risks of depression. [10][11][12][13]

It was postulated that after quitting, people started to feel anxiety, irritability, and depression. [5].Possible reason for it is following: nicotine is a source of pleasure for smokers. Moreover, it was proved that this substance affects the reward system and ability to experience pleasure from other stimuli [14].Therefore, the tobacco withdrawal syndrome could be a possible reason for anhedonia and depression because nicotine deprivation can affect a capacity to experience pleasure and diminish reward value which leads to the inability to enjoy non-cigarette related activities and, consequently, to depression. [6].Another possible reason for depression development is that smokers might use tobacco as antidepressants to overcome already existing depression. Thus, after quitting, symptoms of it become more evident [14].

In 2012, a conducted a review regarding the process of smoking cessation among the patients who suffered from serious depressive disorders found that the effectiveness of the existing strategies of increasing abstinence rates majorly depended on the transpiring depressive symptoms. The data also related to the smokers who had depression in the past in addition to those who suffered from depression at the time of conducting that research project [15]. Despite these linkages, the results of the study allowed the researchers to suggest that there is a chance to encourage patients suffering from depression to engage in smoking cessation activities so as to manage their mood resourcefully. The results of this research were also supported by the findings presented in the article written in 2016[16]. They identified that the existence of a connection between smoking and depression negatively impacts the cessation rates among those who suffer from moderate and severe depressions. Therefore, the researchers suggested that it is necessary to focus on the psychological state of the patients because the latter may subsidize to the advent of disproportionate motivators of smoking and block the cessation process. One of the things that were found to contribute to decreased levels of self-control was cognitive impairment. The researchers supposed that it would be reasonable to conceptualize the psychological mechanisms of smoking cessation and find a way to maintain their depression-quitting behavioral patterns. Therefore, the authors of the article advocated for the creation of a framework that would take into consideration the internal state of the individuals so as to mitigate the outcomes of depression. Furthermore, a systematic review of longitudinal Studies that used clinical

measures of depression were more likely to report a bidirectional effect, with a stronger effect of depression predicting smoking [17].

2.3 Positive impact of smoking cessation on depression:

The psychosocial connections between the two are recurrently confirmed by the neurobiological implications of depression. It is also interesting that smoking has a certain influence on the cholinergic system. As a consequence, smoking individuals suffering from depression may improve their concentration and perception of the world. Therefore, despite a commonly adverse connotation of smoking, a number of pleasurable sensations are associated with this bad habit [18].

In a systematic review and meta-analysis of existed researches which dedicated to a mental state of people immediately before and six weeks after quitting. Overall, 26 studies were included in the meta-analysis. In these studies, data about depression level and other mental disorders was obtained from different questionnaires, including PHQ-9. According to the results of the meta-analysis, smoking cessation is associated with mental health improvement. Participants of the investigations demonstrated a lower level of depression symptoms. Results were similar for both general population and clinical patients. A possible mechanism of depression symptoms' decrease is the following: nicotinic pathway appeared in brains of smokers. This pathway results in the depression mood and anxiety short after an act of smoking. Approximately after three weeks after cessation, nicotinic pathway disappeared, and neurological functions of a former smoker become the same as functions of a non-smoker [5].

2.4 Ways of quitting smoking:

There are nine ways of quitting smoking based on the scientific literature review and one may choose any method based on the health status. For example, smokers who have history of depression or any mental health have to use specific intervention strategies which are also discussed in this paper below [19].

- Unassisted: This is a type of quitting smoking where an individual takes without any help from a medical professional. It is a popular behavior for former smokers who have made several attempts (usually most of them utilize different techniques on each occasion) to stop smoking even before obtaining long-term abstinence [20]. It is in the public domain that most of smokers try to quit without any help from the experts [21]. This is also referred to a "Cold Turkey"; instead these people utilize home remedies. Former smokers make several tries before they can completely stop smoking successfully. Identification of the type of approach or technique that will be most successful is the hard process hence most of the smokers use this method. In most studies, unassisted quits attempts are the most, however; the number has been projected to reduce in the future. The most common technique of unassisted quitting is "Cold Turkey." This concept is referred to abrupt quitting from a drug and in this case, is an immediate and total cessation of the nicotine utilization [22]. The advantage of this technique it is cost effective and if completely works the addict will never use nicotine.

This is because it is voluntary and no medication is involved. However, its limits include; there are high probabilities of obtaining withdrawal symptoms and increase cases of depression.

- Medication: According to the American Cancer Society, a significant percentage of smokers utilizing medicines can be free from smoking for more than six months. Medication can be in single proportion or a combination. Single medication includes; Varenicline which is recognized as a first-line medication for smoke stopping because it decreases withdrawal symptoms and significantly reduces the urge to smoke. Other single medications include; nicotine replacement therapy (NRT), clonidine and antidepressants [23]. The medications work to reduce withdrawal hence there is a high likelihood of reduced withdrawals symptoms to addicts. Its disadvantage is that it is costly single the addict has to purchase them from the healthcare facilities.

- Psychosocial approaches: It involves several techniques for which one can select any or a combination. They include; Great American Smoke out which is an activity held annually which welcomes smokers to stop smoking for one day and with an aim that they can quit for long[24].Additionally, one can select individual or group psychological support which can assist him or her to quit. When using this method, one can combine it with medication and ensure attending all the set sessions this will make it effective.

- Cut down to quit: This technique involves gradually reduction whereby the addict slowly reduces daily consumption of nicotine. Theoretically, this can be achieved through reciprocated changes to tobacco (cigarettes) with a smaller amount of nicotine. This is by slowly reducing the count of cigarettes that one smokes in a day, or by smoking a small percentage of cigarettes on each event. This is an effective means of smoking cessation since it is a gradual process.

- Biochemical feedback: It involves identification assessment and monitoring of the smokers. This method allows the smoker to check the impacts of smoking on his or her body and the immediate effects of quitting. For example use of breath carbon monoxide monitoring which detects cigarettes use, impacts and advantages of quitting.

- Use of substitutes for cigarettes: This involves the use of alternatives to cigarettes. For example, NRT which involves replacing tobacco with nicotine. Other alternatives include chewing cinnamon gums or sticks and electronic cigarettes.

- Healthcare systems: These are interventions that are offered by healthcare systems and healthcare providers. They enhance cessation in the people who seek their services. For example, the use of clinic screening system, one-to-one counseling sessions, and cessation therapies [25]. However, this method is expensive because it includes consultation and treatment fees.

- Alternative approaches: These include techniques such as usage of herbs, aromatherapy, acupuncture and hypnosis among others.

• Competitions and incentives: It involves using incentives or financial resources to entice individuals to stop smoking. For competitions, the smokers will deport their own money in exchange to quit smoking. The challenge of this program is to get participants since it is own their free will and their money is involved.

• Other approaches include; self-help, community interventions and setting a quit plane and date. All the above techniques can be used for smoking cessation, and addicts or smokers can select which technique best favor theme based on their level of addiction, financial status, and preferences.

2.5 Social demographics

This section deals with the following social groups; age, gender, social status, education level and income

1. Age: Age is a determinant factor when it comes to a smoke cessation. When it comes to being ready for cessation, there are variations regarding age. According to medical research, done by National Health Interview Survey Cancer Control Supplement, the differences are in age groups. The study was to determine the relationships between stage of readiness for cessation (smoking) and background characteristics such as smoking-related attitudes and smoking behaviors for different age groups. The age groups were 18-29, 30-49 and 50 and above years [26]. From the results, it was found out that the young smokers posed attitudes that were most favorable to be ready to put in efforts to quit lighting. Elsewhere, for the age 30-49, the effect of a medical provider and anticipated health impacts of smoking were essential correlates of their readiness. For the 50-year-old and above, those having real health effects of smoking and those who recognized smoking as addictive were observed to be more ready to quit[26].When it comes to the intervention of smoking cessation, there are appropriate ways that can be applied to children and adolescents. The techniques include; motivational enhancements, family communication, school-based nurse counseling, psychological support, life skills training and access reduction to tobacco. This is because in this age group children are still in their cognitive development and are readily available to attempt quitting. The above interventions techniques also vary in children and adolescents having cases of depression. For instance, psychological support and life skills training work appropriately to this age group because of their mental status which involves depression [19].

2. Gender: Gender differences are also noticeable when it comes to a smoke cessation. Women are more ready to consider stop smoking as compared to men. This is because women are met with severe consequences smoking hence quitting for the sake of others. The females favor planning their cessation in advance and also making more often utilization of professional assistance and nicotine replacement therapy (NRT) when compared to their male counterparts [27]. On the other hand, men favor experiencing their smoking as absolutely unproblematic and normally quit for reasons that are more self-oriented. The men scarcely plan their cessation in advance; however, most of them make good use of snuff or snus. In a study, it has been found out that more than men,

women recognized physical challenges in not smoking, but also more personal and social advantages. In women, there are variations in smoking cessation based on their health status whereby pregnant women are more ready to consider quitting than un-pregnant females. Smoking when pregnant can damage the fetus and also the woman. According to 2008 US Guideline, a face-to-face psychosocial solution especially the one that includes intensive counseling it increases abstinence percentages in smoking pregnant women and also works to women having cases of depression. Females who light when pregnant have a high probability of experiencing premature birth. Their kids are normally underdeveloped, poses small organs, low weight and poor immune systems. Basing on a practical review psychosocial interventions play a significant role in helping a woman quit lighting in overdue pregnancy and therefore it can decrease the case of low birth weight for the infants [28]. In women, depression and smoking offer a higher combine health risk and the female smokers are more vulnerable to this risk compared to men. Therefore, by quitting smoking this health risk reduces at a high level. Women smoke because of various reasons including; addiction, hence control pleasure. According to Floyd et al., experiments conducted on reason why women smoke and it was found out that some smoke because they were combating depression (1993). The experiments found out that depressed smokers were 40% less likely compared to non-depressed smokers to have quit smoking [29].

3. Social status: social status involves the environment of person since people in places they can afford. Those of high socials status tend to live in posh places which are clean and have fresh air hence reduced cases of depression. The people who have no homes and financially poor populations are the most affected people concerning the social status level and they have been known to have high percentages of depression. The state of homelessness duplicates the probability of one to be a smoker because he is exposed to smoking through passive and active smoking. This is dependent on other developmental health situations and socioeconomic elements. According to systematic review, depressed homeless people have equal percentages of the need to smoke however they have low likelihood than the other remaining people to be effective in their efforts to abandon. In the US, a high percentage of adults that are homeless and depressed at the same time are ongoing lighters [30]. This percentage is significantly a higher rate compared to that of the overall adult number of 19% [30]. Most of the current homeless smokers state that smoking is a way of coping up with all the societal burden of not having homes. There is a public belief that homeless individual smoking is socially acceptable in the community has also enhanced these trends. The populations who live hand-to-mouth have greater possibilities of smoking and reduced percentages of stopping when compared to those who are over the poverty line. Additionally to the systematic review, that despite the fact that the homeless people as a whole are troubled about short-term impacts of smoking they are not concerned with everlasting adverse effects. The homeless individuals have exclusive obstacles to stop smoking. They include; unregulated days, the problems of getting a livelihood, and immediate needs of survival which displace the yearnings to abandon smoking. The solutions to above obstacles include; behavioral counseling and collaborating with homes to decline

collective acceptability of smoking. The homeless that have high incidences depression because of their state have to consider cessation intervention strategies such as medication and psychosocial approaches to help ensure quitting is effective[19].

4. Education level: There are no clear relationships between education attainment and depression. However, some studies have been carried out though were inconclusive found out that low education level is associated with depression and anxiety [31]. In smoking cessation education attainment has been a factor since it determines readiness and interventions that can be applied. There are differences in smoking prevalence in education groups. For instance, the smoking prevalence is greater for high school diploma than those having graduate degree and undergraduate degree. Similarly, smoking among high school seniors of college-bound is less than those of the non-college bound seniors. For instance, 41% of males with 12 years of education or less and 30% for those between 13-15 years of education[31]. In cessation, it was found out that quitting attempts incline with the increase in education level rises. For example, adult smokers having less than 12 years of education attainment tried quitting but in low proportions. Additionally, basing from the information in 2010 successful and effective quitting also increase with the increase in education level[32].For instance, a high number of adult smokers possessing an undergraduate degree can quit successfully than those with only with less than 12 years of education [32]. The difference is because those with high levels of education levels are aware of the impacts of smoking in their health and medical perceptions about smoking [33]. They will consider taking the views of the medical professionals as the techniques of smoking cessations. However, when it comes to learners who are smokers and want to quit, they use medical and psychosocial techniques based on their knowledge of their health status.

5. Income level: An income level determines the cessation interventions which can be used and also the perception of those who want to quit his occurs both for those with depression and those without. People who have low income have low quitting rates and attempts than those who have high incomes [34]. This is because they do not have financial resources that will help in the maintaining the procedures. Also, they believe that smoking is a form of stress removal hence shows low desires of quitting. However, in the source of income cessation operations in the workplace increase the likelihood of quitting smoking [31]. Additionally, worksite competitions and incentives have to be combined with extra intervention techniques to ensure high effectiveness and success in cessation rates. For the depressed low income workers, small population of them tries quitting successful because they believe their health status has low chances of getting better. Therefore, the techniques that can be used by them should be affordable bust most of them use unassisted. On the other hand, for the high-income depressed smokers a number of them try quitting believing it is the cause of their mental health issue and use interventions such as medication. In women, those with low income have high percentage of continued smoking as compared to those who have high income [29].

2.6 Health benefits

1. Physical health benefits

When an individual stops smoking his or her physical health significantly improves which changes the perceptions on the depressed smokers since it forms part of the reward system [35].The health benefits vary from minutes, hours, days, months and years of quitting. An individual may benefit from just 20 minutes after quitting. For example, within 20 minutes after stopping heart rate and blood pressure moves to normal. After 12 hours, the carbon monoxide levels in the blood system changes to normal levels [33]. Between 2-12 weeks the circulation is boosted and the lung functions upgrades hence reduced cases of repertory infections. Within nine months after quitting, shortness of breath and coughing decreases. When one stops smoking for five years stroke risks is reduced and becomes same to that of a nonsmoker. Overall, smoking cessation may improve the significant human parts of the brain which is affected during depression. In the brain, it helps to break the cycle of addiction and then re-wire the brain. This is achieved by returning to normal levels the large numbers of nicotine receptors in the brain within just one month after stopping. Additionally, there are benefits regarding the head and face. For example, smoking cessations lead to a sharp hearing, improve the night vision and assist in the preservation of the overall vision by eliminating the damages that smoking causes to the eyes. It also helps improve the hygiene of the mouth since the teeth will become stained to become whiter and have fresh breath. Ex-smokers shave a lower probability of getting gum disorders and premature loss of their teeth compared to smokers. Smoking cessation has been regarded as better than using anti-aging lotion. This is because it has been found out that it inhibits facial aging, clears blemishes, and protects the skins from pre-mature aging and wrinkling. Typically, the skins of non-smokers get more nutrients such as oxygen and when one stops smoking it can reverse the jaundiced lined complexion that the smokers usually possess. Therefore, when a depressed patient who has not been caused by smoking sees such improvements in the physical health, it helps in driving him to consider quitting [35]. In this scenario the cessation can be successful due to already set mind of the patient.

Similarly, smoking cessation has benefits concerning the matters of the heart. It is in the public domain that smoking is among the leading causes of heart diseases and heart attacks. However, most of these attacks can be reversed through smoking cessation. It lowers blood pressure and heart rates immediately from the first 20 minutes. The heart attacks risks declines within the first 24 hours[33].Also, when one quits smoking blood becomes thinner than smokers and hence reduced the likelihood of formation of dangerous blood clots. Therefore, the heart will find it easy to perform its functions since it can carry out blood around the body with ease since no blood clots. It also lowers the cholesterol levels in the body system. When an individual quits smoking, this will not lead to getting rid of fatty deposits that already exists instead it reduces significantly the levels of fats and cholesterol that is circulating in the blood. This will assist in building up a new fatty deposit in the arteries of the ex-smokers. When a

smoking depressed individual who is quitting observes such benefits in his body which provided for by the doctor, cessation will be successful and depression incident would be reduced.

The lungs of an ex-smoker also benefit from smoking cessation. Firstly, it stops damaging the lungs. When lungs are scarred it is impossible to reverse; hence it is advisable that one quits smoking to prevent permanent damages. After two weeks of quitting it is noticeable that one can run or walk the stair with ease because there is a decreases case of shortness of breath. Secondly, smoking cessation prevents emphysema which has no cure. Smoking for long will damage the air sacs in the lungs therefore by quitting it prevents further damage hence prevention of development of this condition. Additionally, it leads to return of cilia. When a person quits smoking, cilia will begin re-growing and be regaining its normal duties quickly. One of the signs of cilia are coming back to normal is when a person who coughs more than usual. When cilia are working correctly, there is a high probability of fighting off infections and cold and also reduced the cases of getting cancer. A depressed patient will feel better when such news is given to him and when he is on the verge of quitting it will be successful due to the changed perceptions [35].

Smoking cessation also leads to lowering of stomach fats and also it reduces the risk of having diabetes. In case one has diabetes stopping will help in keeping the blood sugar levels regular [36].For women, they benefit from smoking through having normal estrogen levels. Also, it helps it increases the chances of women getting health pregnancy. Similar, it leads to a reduction of erectile dysfunction and improves the chances of better sexual life. The blood and the immune system are also improved. For instance, the white blood cells counts will return to normal, and immunes system becomes stronger because they are not exposed to nicotine and tar. Lastly, the muscles and bones are also enhanced by smoking cessation. This is because quitting will improve the availability of oxygen in the blood system which will make muscles healthier and stronger.

According to medical experts, quitting smoking leads to fertility. Women who are non-smokers find it easy to find essay to pregnant when they have no complications than those who smoke. Smoking cessation improves the lining of the womb hence making the women more fertile than smokers [36].For the men, quitting smoking makes their sperms more strong. Also, it enhances the prospects of delivering a healthy child. Smoking cessation results in improved taste and smell. Such people will discover that food smells and tastes better as tier noses and mouth recover from being suppressed by chemical toxins from tobacco.

Smoking causes premature death and also decreases life expectancy. Almost half of the heavy and long-term smokers die early because of the diseases which are caused by smoking. The disorders include; heart disease, lung illness, and chronic bronchitis. Men who stop smoking by the age of 30 years usually add an extra ten years to their lives. Smokers who quit at the age of 60 add three years to their lives [36]. Therefore,

smoking cessation improves the lives of people by adding years to their lives and reduces the risks of getting diseases hence making them happy at old age. A smoke-free home helps in protecting the loved ones. When one quits smoking will assist in protecting their families' especially those who do not smoke. Non-smokers are at high risks of getting lung and heart diseases because of no-passive smoking. Children who smoke passively from the adults are at the highest risk of getting diseases such as pneumonia and asthma. Therefore, through quitting a clean environment free of risks will be provided to the non-smoking populations. In conclusion, smoking cessation is very critical to the physical health of persons who were smokers and for the patients with cases of depression quitting will be successful when they see observable changes in their health.

2. Mental health

The mental health of a person involves psychological, social and emotional well-being. Lighting stoppage has been associated to improved mental health of an individual. For example, based on a meta-analysis of smoking and mental health, it was observed that smoking cessation was linked to enhanced mental health outcome in both general and clinical populations. The clinical population was consisting of both chronic psychiatric and physical conditions. The investigators specifically found out that people who quit smoking experienced enhancements in depression positivity, anxiety, stress and psychological quality [36]. This was when they were compared to their counterparts who were continuing with their smoking behaviors. Also, people who have attention deficit hyperactivity disorder have been found to having high chances of starting to smoke and low in quitting. There have been debates on whether smoking cessation completely has positive impacts on the mental health based on its side effects.

2.7 Side effects of smoking cessation

a) Depression

Nicotine acts like a psychotic drug, therefore; its withdrawal triggers an emotional upset hence a cause of depression. Nicotine addiction nicotine results in the downward control of the production of stimulatory neurotransmitters such as dopamine. This is because the brain tries to pay up for the alternative stimulation created by smoking. Therefore, when one quits smoking depressive symptoms may result which are depressive symptoms that are common for smoking cessation. They include; sadness, sleeplessness, fatigue, difficulties in concentrating, emotional irritability, sudden changes in appetite and loss of interests in hobbies.

According to an experiment conducted by Covey et al., on major depression following smoking cessation, they observed a three-month tendency of new major depression after smoking cessation treatment[38-39]. This was greater in the presence of the people who have a past of depression as than those who have no history of such incidents. From the results of the above research, one can conclude that it is essential to obtain information on the history of depression while determining the intervention strategies to be utilized.

When such a history is found, being alert is the probable onset of depression even after finishing smoking cessation treatment. It has been recommended that sertraline and fluoxetine can be vital cession aid for smokers with past major depression. Additionally, based on the systematic review, smokers with past depression effectively gain from mood management counseling and nortriptyline as smoking cessation help. However, according to a current international study which compared smokers who had quit for three months to smokers who were continuing observed that quitting smoking did not seem to incline depression. Also, this aftermath of lighting cessation is most common in women than men [37]. This is because incidences of depression are most popular in females than in men. It has been recommended that for people experiencing mild depressions to try out the following technique to help them overcome them. Getting out for a walk since fresh air and exercise plays a significant role in releasing endorphins in the brain that enhance moods [40]. Spending time with people that make them happy and good, setting achievable goals and creating a list of things to be done when feeling the urge to smoke also help during the mild depression.

b) Anxiety and stress

In psychology, anxiety is defined as the feeling of being unease or nervousness or worry about the outcome of something and in this case about quitting smoking. People who engage in smoking have their reason, for example, some smoke because it is a way of releasing stress, some because of societal pressure. Therefore when they stop they will be unease about how this will turn out be. It is a symptom of withdrawal from something for which in this review is nicotine. Numerous researches have observed a relationship between smoking cessation and elevated anxiety. This especially occurs in the first 2-4 weeks after the cessation process[21]. Nicotine withdrawal makes individuals feel anxious and jittery for which is the cause of stress [41].Smoking people makes smokers to feel good not because it eases stress it is because it offers the next dose of nicotine. Breakage of nicotine addiction is stressful. This is because stress releases a chemical from the brain known as epinephrine. This brain chemical alters with the ability to concentrate and think clearly. Therefore, in attempting to quit they become stressful since they cannot focus on the goal. When an individual who is attempting to quit smoking and has a plan of cessation loses focus on the objective and goals, then this will result to anxiety and stress because of fear of the outcome of losing focus [37]. However, experts have provided some strategies that can help in dealing with such situations. For instance, one can solve short-term nagging stresses in advance and learn to recognize the signs of stress [5].Additionally, one is advised to involve in things and vents that they enjoy and should practice being relaxed.

2.8 Use of Patient Health Questionnaire (PHQ-9)

One of the healthcare systems and healthcare professional solutions to depression is by use of a PHQ-9 scale. In this scale, there are nine questions provided to patients in a primary care context with the aim of screening for the availability and severity of depression. The results from this scale are used to monitor the severity of

depression and response to treatment-based DSM-IV criteria and require only three minutes to complete it. The entire of all the nine responses from PHQ-9 are aimed to project the severity and presence of depression. This technique can be applied in the research topic to check for the presence of depression and severity before determining which smoking quitting method can be used. Also, after stopping to light some of them may develop mood disorder and depression as an aftermath. For the patients who will have a sensitivity and specificity of 88% they are having a major depression [42].

2.9 Success rates

There are several factors which influence the success of smoking cessation. The color of the skins affects the success and effectiveness of quitting. The dark-pigmented skin makes it harder for people to stop compared to those possessing pale skin. It is because nicotine has a high affinity for tissues containing melanin. Hence, it causes high levels of dependence on nicotine and lower quitting percentages in the individuals with darker pigments [43]. Similarly social component influences the success of cessation. According to a research that was conducted in 2008 of a populated interconnected network of 12,000 people found out smoking cessation rates are increased [44]. This is because smoking cessation activity carried out by one person reduces the chances of others to smoke. For example, in a marriage whereby both partners smoke, when a wife or husband quits the other partners will attempt to stop. Expectations and attitude factors influence the success of cessation. For instance when an individual has a self-perceived cycle where he knows smoking is bad and especially when depressed, but them smokes to alleviate the bad feeling; this will be hard to break the cycle.

3. STUDY RATIONALE AND OBJECTIVES

This study aims to explain whether if there are depression signs (changes in mood) before the decision of quitting smoking and after six months of this decision. The Saudi Males in Eastern Province are the sample in this study. Females are excluded from study sample due to culture reasons along with their refusing to admit smoking behavior.

4. METHODOLOGY

Research question:
Does smoke cessation affect depressive symptoms in Saudi male smokers?

Null Hypothesis:
There is no difference in depressive symptoms after smoking cessation.

Aim:
The purpose of this study is to understand the relationship between smoking cessation decision, and depression. Do depressive symptoms of the smokers that went through Patient Health Questionnaire increases, decreases or not change at all(PHQ 9)?

Study area:
Cessation Clinic in Dammam, Eastern province, Kingdom of Saudi Arabia.

Study period:
May 2017 - January 2018

Study design:
Descriptive Cross Sectional Study through interviewing Saudi males by using PHQ9 questionnaire in Smoking Cessation Clinic in Dammam during their first visit. In the first stage, the consent was taken from participants, and then the information was collected by the interviewer.
In the second stage, Phone Call Interview was done by the interviewer after 6 months, using the same questioner in order to examine the success or failure of quitting smoking.

Study population:
Adult Saudi men, aged of 17- 60 years old, who visited the Smoking Cessation Clinic in Dammam, at the period of the study.

Inclusion criteria:
The participants of this study should fall into the following criteria in order to be accepted in Smoking Cessation Clinic, which are:
• To be Saudi male,
• To have the determination to quit smoking, and willing to follow the clinical instructions.

Exclusion criteria:
Individuals who fell under these criteria were excluded from our study:

•Non- Saudi Male
• Female
• Does not have the willing to quit smoking, and is not forced to do so by family.

Sampling:
Adult Saudi men, age from 17 to 60 years old, who visited the Smoking Cessation Clinic in Dammam, at the period of the study. The sample included a total of 110 men who went through the process of Smoking Cessation and were interviewed by using the PHQ-9 Depression Test before and after smoking cessation. After 6 months, 75 participants were interviewed by phone call, while the others did not respond.

Data collection tool:

- Patient Health Questionnaire (PHQ 9), was used by the researcher and a trained profession during the first visit for the Smoking Cessation Clinic.

- PHQ 9 is a multi-purpose instrument for screening, diagnosing, monitoring and measuring the severity of depression. It includes nine questions, and incorporates DSM-IV depression diagnostic criteria with other leading major depressive symptoms into brief self-report tool. The tool rates the frequency of the symptoms, and which factors affect the severity.

Scoring of PHQ9:

- 0-4 Normal range or full remission. The score suggests the patient may not need depression treatment.
- 5-9 Minimal depressive symptoms. Support, educate, call if worse, and return in
  1 month.
- 10-14 Major depression, mild severity. Use clinical judgment about treatment, based on patient's duration of symptoms and functional impairment. Treat with antidepressant or psychotherapy.
- 15-19 Major depression, moderate severity. Warrants treatment for depression, using antidepressant, psychotherapy or a combination of treatment.
- 20 or higher Major depression, severe severity. Warrants treatment with antidepressant and psychotherapy, especially if not improved on monotherapy; follow frequently.

The PHQ9 also has a clinical utility factor. Due to the fact that it is a brief tool, it is widely used in a clinical practice. The internal consistency (Cronbach's alpha) of the questioner was 0.53[45].

Self-Administered Questionnaire Factors:

Self-administered questionnaire structured by the researcher and will be validated by three consultants using Cronbach's alpha. The questionnaire will consist of:
- Socio-demographic data
- Personal history of smoking
- Likerd scale to assess depression.

Independent variable:
- Age
- Financial status
- Social status
- Professional status

- Educational level

Dependent Variable:
Depression

*Self-administration questionnaire can be used in other studies.

Data entry and analysis:
Data has been entered and analyzed by Statistical Package for the Social Science (SPSS, 2012) version 21. Continuous variables will be presented as mean and standard deviation (SD), categorical variables will be presented as frequency and percentage, Chi square test will be used to compare 2 or more qualitative variables, Student's t test to compare 2 independent quantitative variables and ANOVA test to compare more than 2 independent quantitative variables. Significance will be determined at p value < 0.05 and Confidence interval of (95%CI). Other appropriate statistical tests will be used as indicated. This well be done with the assistance of statistical advisor.

Ethical issues:
An approval is obtained from the Individuals who are participating in the research. The personal information of all participants is kept confidential while fulfilling the purpose of the research which is for scientific reason only. Individuals are allowed to stop completing the survey at any time for any reason whether they are discomfort or not. Approval of the study requested from Ministry of health research committee prior the implementation of the study.

Budget:
It has been self-funded

5. RESULTS:

The participant involved in this study were 110 Saudi male at the beginning of the study, but only 75 responded to the study after 6 months. Their age ranged between 16 to 58 years old. The mean is 34.4 ± SD 9.2.from the table 1, the majority of them were married 80 (72.7%).Most of them had secondary educational level 49(44.5%) and university level 38 (34.5%).Most of the participant occupation were governmental employee 49(44.5%)and privet employee 41(37.3%).most of them have income from (6000-10000) 53(48.2%).

Table1(socioeconomic status):

Variables		No.	Percentage %
Marital status:			
Married		80	72.7
Single		27	24.5
Divorce		3	2.7
Educational level:			
Intermediate		17	15.5
Secondary		49	44.5
Diploma		4	3.6
University		38	34.5
Postgraduate		2	1.8
Occupation			
None		2	1.8
Student		8	7.3
Government employee		49	44.5
Privet employee		41	37.3
Business work		10	9.1
Salary:			
Less than 3000		5	4.5
3000-5999		20	18.2
6000-9999		53	48.2
10000-14999		13	11.8
More than 15000		11	10
No income		8	7.3

Only 75 (68.2%) from the total of 110 responded (68.3%). 11 quit smoking (14.7%). 64 did not (85.3%)

Table 2(Response Rate):

	Quit smoking	Not quit
Number\percentage	11(14.7%)	64(85.3%)
Total	75	
missing 35(31.8%)		

Using paired sample statistics to compare the mean of PHQ-9 during interview 3.9 ± 3.6 in comparing PHQ-9 after joining the quitting smoking program 6 months later 3.1 ± 5.6

There was no significant statistical difference P value 0.696 among the 11 participant who succeed of quitting smoking.

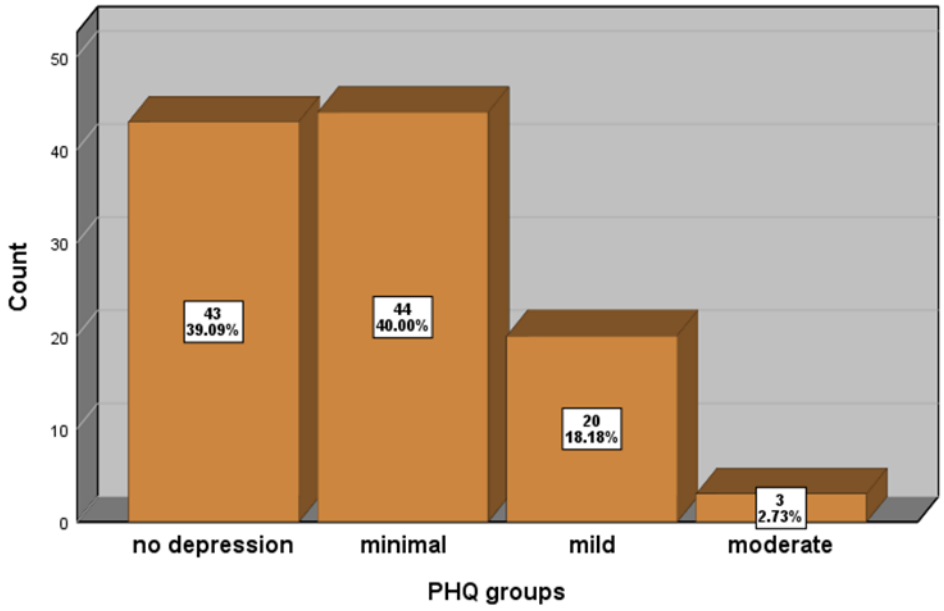
Table 3 (PHQ 9 mean during and after quitting smoking for participants who succeed)

	Mean	No.	SD	P value
PHQ-9 during interview	3.91	11	3.562	0.696
PHQ-9 after quitting smoking	3.0909	11	5.57592	

By using paired sample statistics to compare the mean of PHQ-9 during interview for the 75 participant is 5.6 ± 3.9 and PHQ-9 after 6 months of joining the smoking cessation program 4.2 ± 4.7
There was significant statistical difference P value 0.014 among the 75 participant who were joining the smoking cessation program

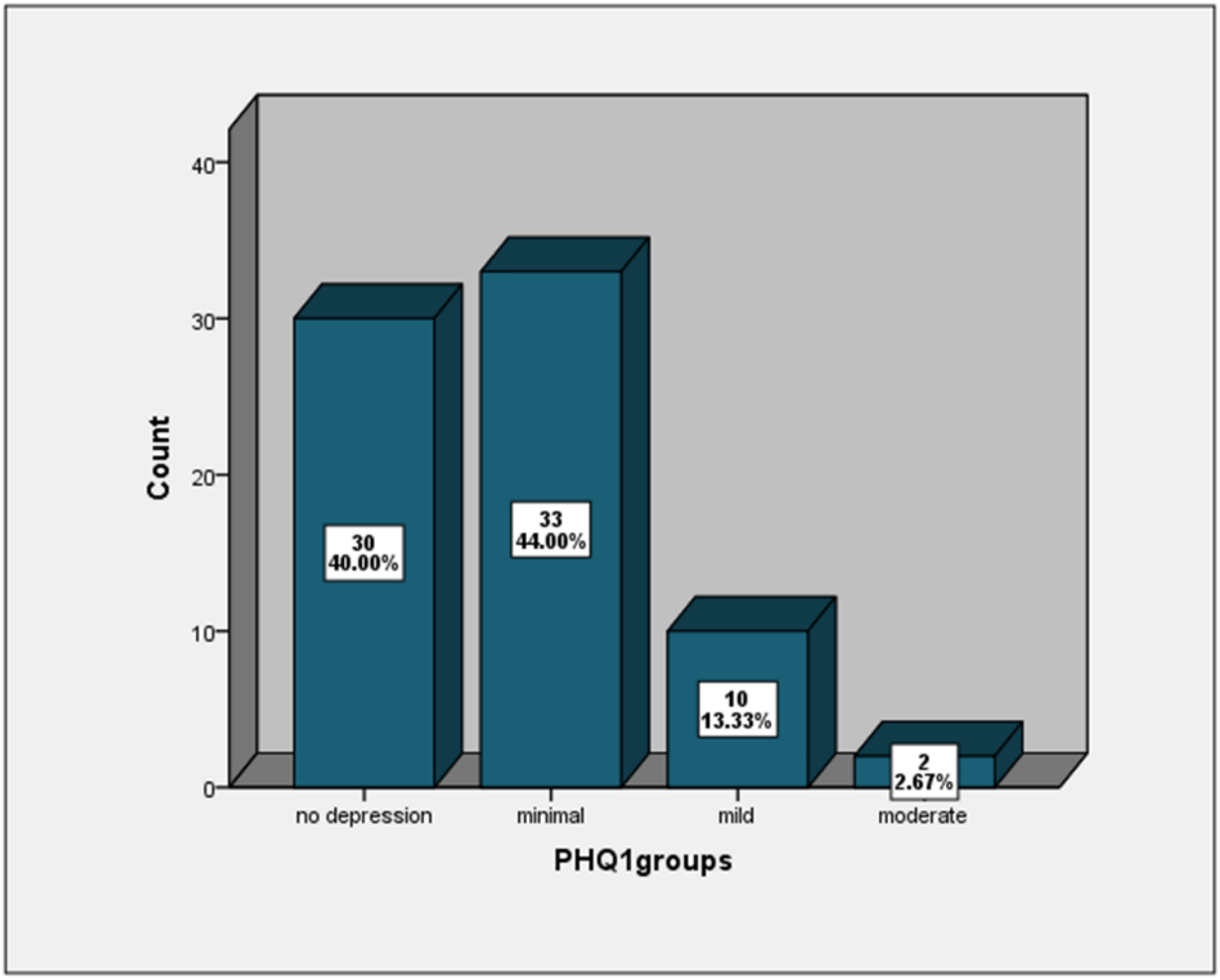
Table 4((PHQ 9 mean during and after quitting smoking for the participants who responded)

	Mean	No.	SD Deviation	P value
PHQ-9 during interview	5.6	75	3.9	0.014
PHQ-9 after quitting smoking	4.2	75	4.7	



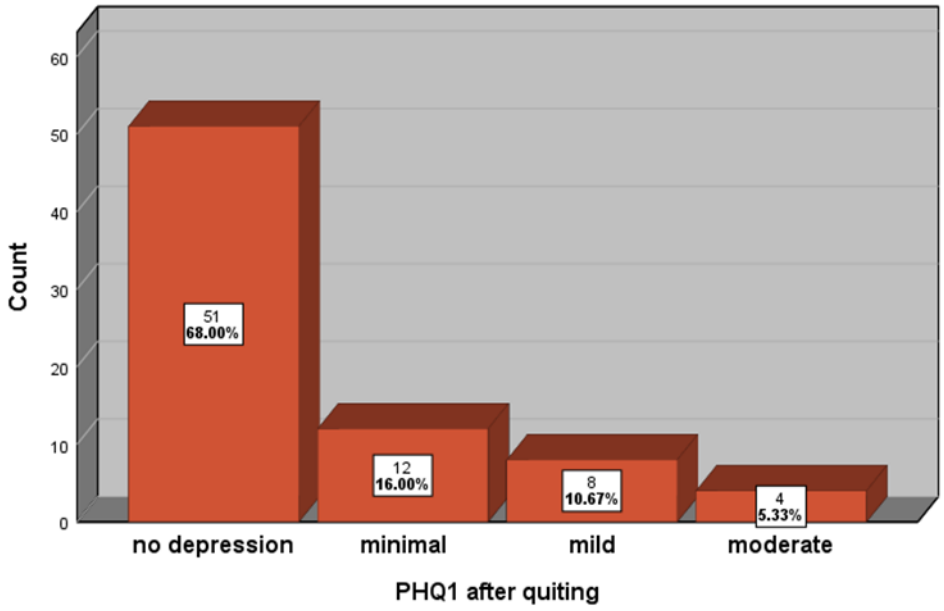
Graph 1(Mood status for all participant during the first interview by PHQ-9)

From this graph, it is shown that from 110 participants, 43 (39.09 %) had no depression, 44(40%) had minimal depressive symptoms, 20 (18.18%) had mild depression and 3(2.73 %) had moderate depression from the first interview in the smoking cessation clinic by PHQ-9. In this study, it is found that there are no cases of severe depression.



Graph 2 (Mood status for 75 participant responded during the first interview by PHQ-9)

From the graph, it is shown that from 75 participants, 30 (40 %) had no depression, 33(44%) had minimal depressive symptoms, 10 (13.33%) had mild depression and 2(2.67%) had moderate depression from the first interview in the smoking cessation clinic by PHQ-9.



Graph 3 (Mood status for75 participant responded at the end of study by PHQ-9)

After repeating OHQ-9 6 months later, 75 participants were respond, and it is shown that 51(68%) were not depressed, 12(16 %) had minimal depressive symptoms, 8(10.67%) had mild depression and 4(5.33%) had moderate depression.

Conducting this study on only 75 Saudi men showed us the significance of smoking cessation in relation to depression. Before the clinical help, 30 of those participants had no depression, 33 had minimal depression, 10 had mild depression, and 2 had moderate depression. After 6 months, and after attending the smoke cessation clinic, 51 smokers had no depression, while 12 has minimal depression, 8 had mild depression, and 4 had moderate depression. This shows that effectively, smoking has a relationship to depression, as lots of smokers who quit (or reduced) smoking have lost or reduced depressive symptoms.

Table 5

PHQ1 groups * PHQ2 after quitting Crosstabulation

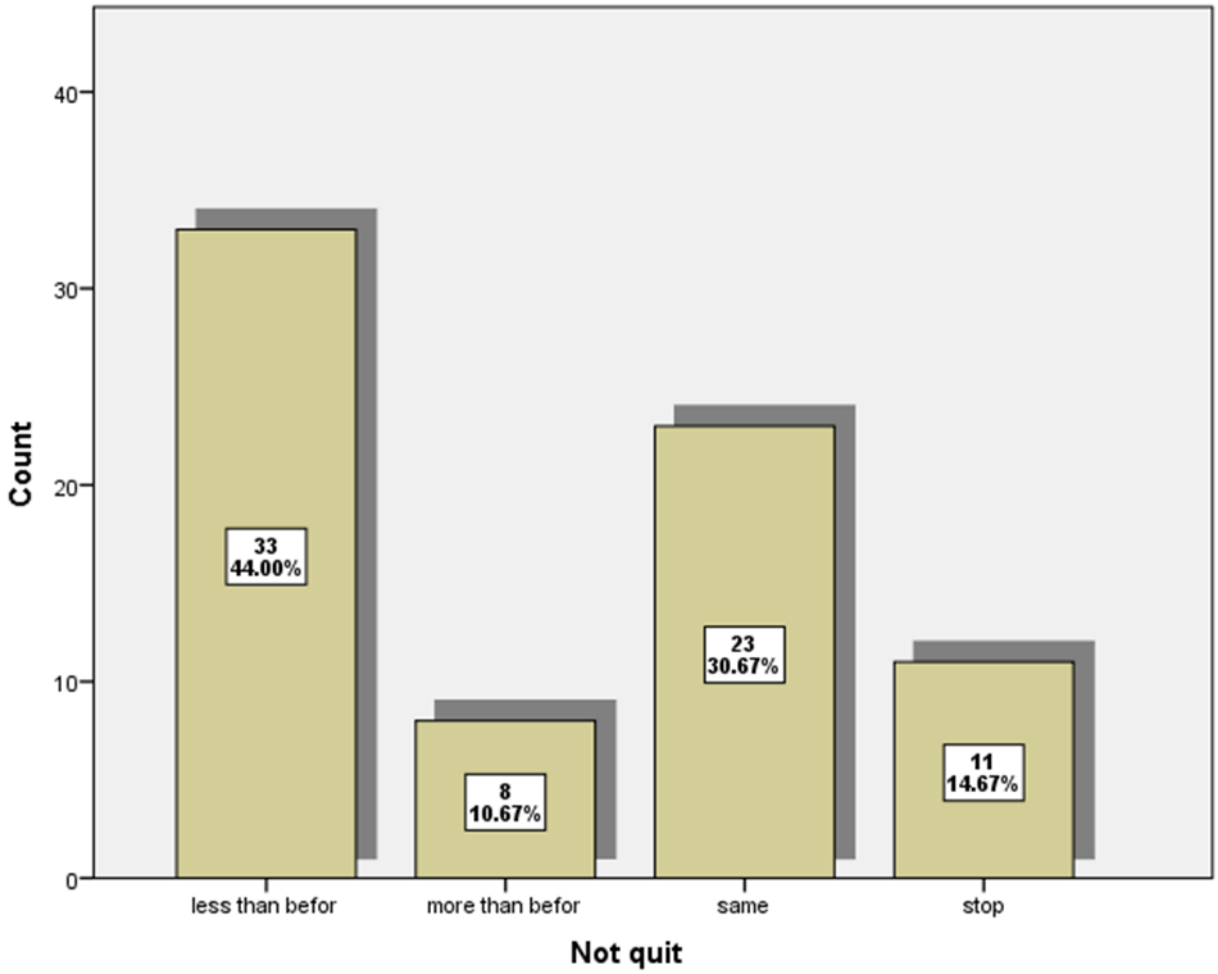
Count

		PHQ2 after quitting				
		no depression	minimal	mild	moderate	Total
PHQ1groups	no depression	26	2	1	1	30
	minimal	20	7	4	2	33
	mild	5	2	2	1	10
	moderate	0	1	1	0	2
Total		51	12	8	4	75

By using crosstabulation to compare 75 participants who responded, PHQ-9 during interview with no depression were 30 (40.0%) in compression with the previous result after 6 months they became 51 (68.0%).participants who had minimal depressive symptoms were 33(44.0%) turned out to 12(16.0%), participants who had mild depression were 10(13.3%) turned out to 8(10.7%), participants who had moderate depression were 2 (2.7%) turned out to 4 (5.3%)

Using the data above, we can conclude that most of the minimally depressed have lost their depressive symptoms after cessation. However, the effect of cessation decreased as we rise through the levels of depression.

Graph 4 (Smoking Statistics after 6 months)
By using the frequency, 75 participants who stopped smoking were 11(14.67%), those smoked less than before were 33(44%), while those who smoked more than before were 8(10.67%),and finally those who did not change their smoking habit were 23(30.67%).



Using the data above, we can see the effective rates of the cessation clinic, as 44 out of 75 patients have been affected positively. Moreover, almost all of those who were affected by the clinic have lost depression.

6. DISCUSSION

In this analysis, we collected data over the course of a Cross Sectional Study to test if there is any change in mood before and after making the decision of quitting smoking. PHQ9 questioner were used to evaluate and analyze the visitors to the Smoking Cessation Clinic. In PHQ9 scale, there are nine questions were provided to patients in a primary care context with the aim of screening for the availability and severity of depression. The results from this scale were used to screen for diagnosis of depression based on DSM-IV criteria and progression after treatment, it required only three minutes to complete it.
The final conclusions of this study are shown that:

- 30 participants (40.0%) who Started the process of cessation shown no depression or mood changes through using PHQ9 scale during the first interview. After six months of the decision and during the second interview, the PHQ-9 scale has shown that the number of people without depression statistically increased by 21 people, raising the number to 51 (68.0%). Those people, however, came from those who had minimal depression. This has shown that the decision to quit has no negative impact on those with minimal depression.
- 33 participants (44.0%) had minimal depressive symptoms at the time of first interview. The number decreased dramatically, with 21 people losing their depression. At the time of the second interview, only 12(16.0%) participants had minimal depression. This also shows that the decision to quit has a positive impact on those minimally depressed.
  10 participants (13.3%) had mild depression at the beginning. After the second interview, the number decreased to 8(10.7%). However, those last two have shown increased signs of depression, and have increased a stage in depression, However, this turned out to be the effect of external stressors. With those stressors in mind, this shows that the clinic has a negative effect on those with mild depression, as they have a lot more stressors then those with minimal depression.
- 2 participants (2.7%) who had moderate depression were increased to 4 (5.3%) and this regression of the percentage was related to the effects of external stressors, as stated above.

The data in table 1 was necessary to collect information about the patients used for this research. Using the information, we can categorize our patients according to the prerequisites mentioned. Table 2 was used to determine the response rate of all patients that were selected for the study, as to avoid the hole that could be created by adding those who didn't respond into the study statistics. Table 3 and 4 were able to identify the significant group, and use that for the study. Then we come to the graphs, each explaining their certain set of data. From table 5, we can conclude that most of the minimally depressed have lost their depressive symptoms after cessation. However, the effect of cessation decreased as we rise through the levels of depression.

From the research, in general, the Smoking Cessation Program was affective tool for treating people since the result showed that 58 % got positive response from the program.
This positive response was reflected in two groups of the study. First group who had decrease smoking than before was 44%, second group who quit smoking which was 14.7. The other factors that affect the result were the level of education and employment, while 20 % of the participant who improved from depressive symptoms to no depression have secondary.

Due to inability to follow up with the 35 missing participant, and only 11 who succeed to quit it, there was no significant statistical difference P value 0.696 among the 11 participant who succeed of quitting smoking. By using paired sample statistics to compare the mean of PHQ-9 _during interview for the 75 participant_ is 5.6 ± 3.9, and PHQ-9 after 6 month of joining the smoking cessation program is 4.2 ± 4.7, there was significant improvement (P = 0.014) among the participant who were joining the smoking cessation program
Education level, 22 %of the participant who improved from depressive symptoms to no depression have work as privet or government employee.

A study that was done by Zhou et al (2009), who try to assess the association between depression and smoking and it is shown that (Attempts to quit smoking and relapse: Factors associated with success or failure from the ATTEMPT cohort study) there is unclear cut for the association between smoking and mental health in spite of the fact that most smoker wanting to quit.[46]On the other hands, many smokers who continue smoking report that smoking cigarettes alleviate emotional problems and feelings of depression and anxiety, stabilize mood. Additionally, it is relieving stress and provides them with mental health benefits which indicated by quantitative and qualitative analyses. [47], [48].

Another study which was done by Taylor, G. (2014) shows that Smoking cessation is associated with reduced depression, anxiety, and stress and improved positive mood and quality of life compared with continuing to smoke which support our study

7. LIMITATIONS

The number of responding participant was 75 out of 110, while the remaining 35 participants (31%) were not easily reached by the researcher. The other limitation is the poor contacting method with the participants to motivate them to keep on the quitting process, as there is an issue with the services of the clinic, the time providing and availability of the appointments. The third limitation of the study is the amount of men powers who can provide the services. The other limitation is related to life stressors that we have no control on, as social challenges and other external factors. For example, one of the participants has been progressed from mild to moderate depression due to the

death of his daughter in the middle of the study. Finally, the availability of therapeutic medicine were limited, which made it hard for some of the participants to quit without medications, and the locations of the centers were not easily reached by all participants, which made it hard for some of them to come or to continue.

8. CONCLUSIONS

Through our research, we have found that Smoking Cessation Clinic has a positive effect on 58% of the participants, while 44% of them decrease smoking, 14.7% quit smoking.
Along with the positive effects of the program, we have also found that there is no major impact of the program on people who were classified mild and moderate as the statistics showed earlier. On the other hand, they study shown that there is a positive effects on the people who are classified minimal. We finally recommend these programs from all people who wants to quit smoking whether they are not depressed, or they have moderate depression.

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TABLE OF FIGURES