

2016

Screening for Depression in the Primary Care Clinics in Saudi Arabia

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Screening for Depression in the Primary Care Clinics in Saudi Arabia

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Date of Submission: April 11, 2016

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Abstract

Background: Depression has a significant morbidity rate internationally and it is associated with poor health status and reduced quality of life in the community. A lack of identification of depression on primary care practices has been associated with lack of screening tools or specific protocols and lack of adherence to practice-level guidelines and depression screening implementation. *Purpose:* This project assessed whether primary care medical providers in Saudi Arabia were able to recognize the symptoms of depression in their patients and tested a new protocol and tools to address the issue. This study focused on the population that was visiting a large Healthcare Medical Facility in Dhahran, Saudi Arabia. *Results:* 150 patients were screened. The results indicated that up to 34.6 % of the patients turned out to be positive with majority being women of reproductive age. It also indicates that majority of the people in need of these services are women. *Conclusion:* This has confirmed the need for such a screening tool in primary health care facilities in Saudi Arabia. The results further indicate that early diagnosis of depression by such facilities will lead to improved management, increase quality of life, and potentially save resources for the patients who would have been referred, making this project very timely and relevant.

Keywords: depression, primary care setting, depression screening, screening tools.

Introduction

Background

Depression is a prevalent, costly, and disabling syndrome that is linked to significant morbidity, poor health status and quality of life, and increased health costs worldwide (Baas et al., 2009; Romera et al., 2013; Chin et al., 2014). It affects an estimated 16-20 million people in the United States of America (Yano et al., 2011). The prevalence of major depression in Europe is estimated to be 8.5% (Al-Qadhi, Rahman, Ferwana, & Abdulmajeed, 2014). Depression prevalence in primary care settings in the United States varies based on the subtype, with minor depression at 8.4-9.7%, dysthymia at 2.1-3.7%, and major depression at 4.8-8.6% (Al-Qadhi et al., 2014).

The cumulative prevalence of all types of depression in primary care patients has been estimated between 10% and 20% (Chin et al., 2014). However, such statistics underestimate the true prevalence of depression in primary care, as researchers have shown that clinicians document only about 21-50% of the cases being detected (Yano et al., 2011). Reports show that primary care physicians fail to recognize the symptoms of depression in 30-50% of patients with depression. This has been linked to lack of utilization of screening tools or specific protocols for depression in primary care (Romera et al., 2013), to lack of adherence to practice-level guidelines, where such guidelines exist (Yano et al., 2013), and noncompliance to screening implementation (Romera et al., 2013). Failure to recognize depression in the primary care setting is likely to prolong depressive episodes, extend the patients' duration of suffering, and reduce the chance of recovery (Al-Qadhi et al., 2014).

Screening for depression entails using depression questionnaires to identify depressed patients who have not sought treatment and have otherwise not been acknowledged as depressed

by health care providers (Thombs, Zielgelstein, Roseman, Kloda, & Ioannidis, 2014). Without systematic screening, general practitioners are likely to miss at least 50% of major depression cases in primary care (Arroll et al., 2010). The gap in depression screening is evident in Saudi Arabia because primary care patients attending the primary care clinics or the family practice clinics are not being screened for depression. Consequently, cases of depression are not being detected early enough and the majority of patients are only diagnosed when they are at advanced stages of major depression. In addition, the health system has not adopted any screening tool for screening depression in primary care clinics areas. The late detection of depression in patients attending the primary care clinics has resulted in increased depression-related morbidity and mortality, increased healthcare costs, reduced quality of life, and additional burden to the society. The screening for depression in all adult patients attending the primary care clinics in the hospital is therefore recommended and the purpose of this DNP intervention project.

Problem Statement

Despite the high prevalence of depression and its link to considerable morbidity and increased health care costs, it remains underdiagnosed, undetected, and undertreated in a large proportion of adult primary care patients even in Saudi Arabia. Currently, the Saudi Arabian population affected by depression is more than 5.7 million out of the total population of 29 million (Pressler et al., 2011). In the presence of other diseases, co-morbidity of depression has been shown to be the cause of increased morbidity, mortality, and low quality of life (Jiang et al., 2011). However, the screening of patients with depressions presents a unique challenge to researchers and practitioners as depression shares several signs and symptoms with other diseases.

The shared symptoms include weight gain, lethargy, and decreased activity tolerance. Very few studies exist demonstrating screening for depression in the primary care setting in Saudi Arabia (Pressler et al., 2011). According to Grunauer et al. (2014), the burden of untreated depression in the primary care setting is substantial. Failure to recognize depression through screening is likely to lead to prolonged episodes, decreased likelihood of recovery, reduced quality of life, increased duration of patient suffering, and increased cost of medical care. At the primary care hospital in Saudi Arabia, John Hopkins Aramco Healthcare (JHAH), there are no screening protocols for depression in the primary care clinics.

The lack of routine depression screening leads to primary care patients who are not treated for depression and this leads to poor health outcomes and a decrease in quality of life for patients and their families (World Health Organization, 2013). The purpose of this DNP project was to develop a useful and effective guideline aimed at early detection of depression in adults within primary care settings in Saudi Arabia. This project intended to help avoid the effects associated with late detection of depression such as increased depression-related morbidity and mortality, increased health care costs, reduced quality of life, and additional burden to the society (Cully, Jimenez, & Deswal, 2009).

Objectives of the Study

The main objective of this DNP project was to address depression at the primary care clinics by using screening tools for early detection of depression cases in patients.

Specific Objectives

1. To increase health care provider knowledge about patient management of depression including the ability to carry out initial examinations using the screening tool.

2. To increase awareness of the availability of the screening tool at the primary clinic and necessary management strategies of depression in the hospital.
3. To increase collaboration between different departments of screening care providers for effective diagnosis and management of depression.

Theoretical Framework

The implementation of the Pender's health promotion model was designed to ensure that the approach to health provision took into consideration the importance of health protection (Davies & Macdowall, 2006). The basis of the approach adopted in the health promotion model is geared towards ensuring that individual attributes are taken into consideration to ensure that an individual's reaction or expected transition is well documented to take account of the changes that are experienced. The significance of the approach is detailed in its impact on behavior and its ability to change the motivation attributes of an individual. The success of the approach is dependent on a set of variables that are coordinated to ensure that the outcome of the health promotion approach follows the desired path. The flexibility of variables that influence the process is instrumental as they can be altered through nursing actions.

The outcome of Pender's health promotion model is dependent on the variables that influence the individual's behavior, which results in improved health outcomes (Downie, Tannahill, & Tannahill, 1990). The classification of various behavioral stages ensures that the individual in question is able to develop into a new stage that allows the integration of the aspects learnt through the changing stages. The concepts of this approach are diverse, but it is vital that one considers the health promotion concept. The purpose of the approach above is to ensure that one's behavioral preferences are altered to reflect alternative preferences that enable one to desire to lead a healthy life. Preferences that affect prior behavior such as feeding habits,

exercise, and the general outlook on life, which redefines what is essential. The second essential approach is the concept that enables one to maintain their current condition through protection against diseases and the prevention of illnesses that may occur through exposure to unwarranted conditions (Pender & Pender, 1996). The inculcation of a behavioral approach that increases the urge to promote a healthy life ensures that the individual seeks to eliminate all threats that may compromise the promotion of a healthy lifestyle. The third concept that may affect the health promotion approach is previous behavioral inclinations and prior experiences associated with the individual in question. Behavioral studies indicate that changes in an individual's behavior are highly influenced by their will to change, but certain prior experiences and characteristics may affect their progress in their newly adopted lifestyles.

In order for healthy changes to be adopted, the nurse must ensure that the individuals in focus are separated from surroundings or concepts that may cause relapse to their previous behavior. The individual must be certain of the advantages and effects that these transitions will have on their lives. Secondly, the involved person must be aware of the existing impediments that affect their transition and make the necessary changes to accommodate and eliminate the effects that are attributed to such barriers. The uniqueness of the activity has specific approaches that the person in question can take into consideration to eliminate the drawbacks. The culmination of the process is coupled by a number of behavioral outcomes that motivate the individual to proceed with his or her new behaviors.

It is important to note that, irrespective of the changes in behavior, the person in question also has a set of competing behavioral demands that may make it hard to implement the newly adopted approach. To consider the adoption of the process, the health promotion unfolds in a matter of steps which necessitates the adoption of the proper plan (Bickman, 1987). Personal

factors are the major hindrance to the health promotion approach, and the best approach towards averting the effects of the process is the development of personal skills.

According to Sitzman and Eichelberger (2004), one of the principles that ought to be implemented is the adoption of a reorientation approach, mainly in the health services sector, to ensure that the hospital synchronizes the process of health care provision and the disease prevention approach. The importance of the process ensures that the patients are aware of the risks that they face and the new behavioral approach motivates them to adopt a new culture that leads towards the elimination of possible medical conditions.

Issel (2009) presents the definition of the program theory; it is reflective of a number of factors which take into consideration the cause and effect approach. The effectiveness of the process culminating in the expected outcome is highly dependent on the set of steps and laid-down plans. The application of the theory in question to the project involving the screening for depression in primary care in the outpatient clinic in Saudi Arabia is highly applicable. The content expressed in both the health promotion model and the program theory is applicable in ensuring that the total number of patients who succumb to cases of depression are minimized considerably.

As illustrated in the concepts in the analysis above, the application of the health promotion model is mainly meant to focus on behavioral changes, which are the root causes of the adoption of a new outlook in lifestyle changes. The changes in lifestyles have a direct effect on an individual's health since they have a direct impact on the day-to-day activities. The root principles in the health promotion model address personal factors that are the major stumbling blocks towards health promotion. For patients suffering the effects of depression, the best

approach towards eradicating the condition is to ensure that the individuals take necessary steps to seek medical help and follow-up with the projected treatment plan.

One of the subconcepts of the health promotion model is that it addresses psychological factors (Durham, 1995); this is the main concept that is focused on in the project. The objective of this project was to detect cases of depression in Saudi Arabia, but the initial stages of the project assess the cases of depression in one setting. The approach takes into consideration the extent of the problem and formulates a proper framework that takes into consideration the recommendations that are housed in the assessment report. The effects of depression on the patient can therefore be eliminated through adoption of the health promotion model so as to ensure that the root cause of the condition is eliminated. Additionally, this would ensure that persons suffering from the condition change their behavioral approaches. Alternatively, application of the program model enhances the success of the project taking into consideration the changing dynamics that the theory offers in relation to step-by-step illustration.

According to Sitzman and Eichelberger (2004), every assessment process that involves the public must take into consideration the changing preferences that define the approach that every individual seeks to adopt. In order to manage the anticipated incidences, persons tasked with the duty of enforcing the process are expected to remain focused on ensuring that the behavioral adaptations are in line with the execution process. According to Zaccagnini and White (2011), the program theory is an impact and process theory, and its adaptation in the field of health ensures that the nurses oversee the transition process of patients from one that poses a threat to the life of patients to one that enables them to cope with the threats, drawing their strength from a specific interest derived from their behavioral orientation.

Initially, the project started with the communication of the plan to a number of stakeholders who backed the program. The success of the project is based on the implementation of the health promotion model together with the integration of approaches derived from the program theory.

Application of Pender's Health Promotion Model

In Pender's Health Promotion Model, both external and internal variables have influences on health behaviors such as characteristics and experiences of individuals, cognitions that are behavior specific, and the immediate competing demands of an individual. The variables interact and determine the commitment of a person to an action plan that is associated with performances of health behaviors. Through this model, the risk factors for adult depression are embedded within variables of the model (Kroenke, Spitzer, & Williams, 2001).

In this project, a construct of Pender's Health Promotion Model known as perceived self-efficacy or judgment of the personal ability of an individual to carry out an action plan was used in assessing depression in patients (Bekelman et al., 2007). Behavior-specific cognitions that have been proposed to identify direct and indirect influences of behavior change through perceived barriers to action were assessed. This model addressed multiple self-efficacy beliefs identified as the influential factors in a depressed individual's behaviors that appear to be potential cognitive barriers to health promoting behaviors. Cully, Jimenez, and Deswal (2009) proposed that when perceived self-efficacy is higher, efforts to perform behavior will be more vigorous and persistent, even with obstacles and aversive experiences that serve health-habit determinants.

Literature Review

Background Information

Central healthcare organizations recommend regular screening for depression for 13 risk groups in primary care including those with a previous history of depression, heart disease, familial predisposition to depression, chronic pain conditions, stroke, epilepsy, Parkinson's disease, pregnancy or postpartum period, diabetes, cancer, obstructive lung diseases, refugee or immigrant background, and other mental disorders (Al-Qadhi et al., 2014; Chin et al., 2014; Christensen, Sokolowski, & Olesen, 2011; Thombs et al., 2014). Before 2002, there were no major guidelines recommending screening for depression. In 2002, the United States Preventive Service Task Force (USPSTF) recommended routine screening for depression when staff-assisted depression care programs are available to ensure accurate diagnosis and effective management and follow-up. This recommendation was reiterated in 2009 based on evidence from randomized controlled trials (O'Connor, Whitlock, Beil, & Gaynes, 2009). However, Thombs et al. (2014) argue that the recommendation is not supported by evidence from any randomized control trials and that USPSTF should consider re-evaluating this recommendation.

Screening tools are mainly based on two questions derived from the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV) criteria to facilitate the detection of major depression by general practitioners (Lombardo et al., 2011). These questions enquire about anhedonia and mood, followed by a diagnostic interview should the screening turn positive (Grunauer et al., 2014). These two questions have been validated, and adding a third question, that is, the 'help' question, has not been shown to improve screening (Lombardo et al., 2011; Romera et al., 2013).

Several depression screening instruments are available, including the Patient Health Questionnaires (PHQ-2 and PHQ-9), Zung Depression Scale, or Beck Depression Inventory (BDI). PHQ-2 and PHQ-9 have been found to be equivocal in utility (Al-Qadhi et al., 2014).

Despite being readily available, reports show that these instruments are rarely used consistently. Consequently, some researchers propose that the use of technology-based assessment and monitoring tools for depression may improve efficacy. Grunauer et al. (2014) investigated the use of tablet-based PHQ-9 screening for symptoms of depression in Quito, Ecuador and found that it was an efficient and excellent method of screening for depression in primary care patients. However, their study lacked detailed clinical interview and thorough follow-up to verify the diagnosis; hence, the findings cannot be generalized.

Related Studies

Various authors have investigated depression screening in primary care (Al-Qadhi et al., 2014; Christensen et al., 2011; Grunauer et al., 2014; Lombardo et al., 2011; Romera et al., 2013; Yano et al., 2011). Screening for depression has been reported to be about 80% cost effective, even for subthreshold depression, in preventing major depression. Screening for depression in primary care has also been found to be cost saving (Al-Qadhi et al., 2014). However, some studies have shown that routine screening for depression has little effect on the management or outcomes of depression on 12-month follow-up (Al-Qadhi et al., 2014). O'Connor et al. (2009) maintain that depression screening programs without sufficient staff-assisted depression care support cannot improve depression outcomes.

Various strategies for screening for depression in primary care are available including systematic high-risk screening (Romera et al., 2013), case-finding (Christensen et al., 2011), and practice-based screening (Yano et al., 2011). Systematic high-risk screening has been recommended but remains controversial and has not demonstrated any effectiveness in screening for major depression in high-risk patients in primary care (Romera et al., 2013). Christensen et al. (2011) compared the effectiveness of high risk screening, which he defined as those with

other mental health disorders versus case-finding for the identification of depression in primary care. It was found that case-finding and screening of patients with other mental disorders can considerably improve the identification of patients with depression. However, this was an observational study, and controlled randomized trials are necessary to confirm such claims. Yano and colleagues (2011) argue that practice-based screening using patient surveys is effective and can be used as an adjunct to case-finding to improve screening for depression in primary care.

Methodology

Project Design

This project involved both qualitative and quantitative methods. Descriptive data was analyzed regarding how many patients, ratio of males to females. In addition, the body of assessment involved PHQ2, which asks a patient about health condition(s). A qualitative approach aims at providing an understanding of a specific human behavior and factors that contribute to such behaviors (Campbell & Martinko, 1998).

Setting

The DNP project was done at a healthcare medical facility in Saudi Arabia. Saudi Aramco is a fully integrated chemicals and global energy enterprise (Clark, Tahlawi, Facey, Pledge, & Saudi, 2006). John Hopkins hospital is a leading academic and health system with experience in care delivery in the world. The two organizations came together to introduce a healthcare joint venture in Saudi Arabia within the city of Dhahran. The health care seeks to benefit the employees and family of Aramco. The families of the workers are not the only target of the health care system but also the community living around the area. The immediate neighborhood lies in the eastern province of Saudi Arabia. It is the major administrative center

for the oil industry in Saudi Arabia. A higher percentage of this community engages either directly or indirectly with the oil industry.

The DNP project was done in the outpatient department of the medical facility located in Saudi Arabia. It included their primary clinics which comprised twenty single clinics for adults. Ten of the twenty clinics were for males while the other ten were for females, all attended to by two nursing stations and a physician in each room. Additionally, there were specialized clinics along with other outpatient facilities. The medical facility serves the region's community, especially the employees and families of the Saudi Aramco oil company.

Materials

The specificity and sensitivity of the tools were assessed by a team of professionals, and the tools with the highest selectivity, sensitivity affectivity, and culturally acceptability were selected and adopted for use at the primary care clinic. These materials are PHQ-2, a highly sensitive test to screen for depression (Citation).

Sample

A stratified sampling technique with the help of a statistician was done to facilitate the success of this study. The technique was used to determine the size of the study populations that would provide the information required for the study. The sample included all adult patients above 18 years old attending the primary care clinics. Patients who were already attending the psychiatric clinics were excluded from the project.

Instrument

The following instruments were used in this study; the first instrument was PHQ-9 (Patient Health Questionnaire 9). This is a self-reported depression component for mental disorder primary care evaluation procedures that has been validated for primary care diagnosis of

depression (Bogner, Ford, & Gallo, 2006). This instrument uses scores of criteria of 9 DSM-IV from zero to three. The overall sensitivity of the PHQ-9 is 80% while its sensitivity has been shown to be 92% for depression diagnosis. The instrument is also important in evaluating symptom severity, i.e. 20-27 severe, 15-19 moderately severe, 10-14 moderate, 5-9 mild, and score 1-4 minimal. The second instrument used in this study was that of sociodemography and co-morbidity personal data questions that have been adapted from previous surveys done in Saudi Arabia.

Screening Strategy

PHQ-2 (Patient Health Questionnaire – Depression Subscale 9) was selected for this study because it is short, can assess the severity of the disease, and can be well performed due to its high sensitivity, specificity, and accuracy. The tool has been validated in several primary care populations. Patients who meet the selection criteria arriving at Johns Hopkins Aramco Healthcare Medical Facility in Dhahran, Saudi Arabia were issued with participation consent forms (Bogner, Ford, & Gallo, 2006). Those who provided the consent form were given the PHQ-2. The employees, social workers working at the primary clinics, the psychiatric department, psychoanalysts, the psychologists, the nurses, and the physicians working at the clinic were involved in the screening process (Cash & Glass, 2011). The suggested workflow and its purpose were presented at a staff meeting. The already filled questionnaires were returned to the DNP student daily for evaluation and data analysis. All questionnaires were coded with patients' ID numbers for confidentiality purposes.

Description of the Group, Population or Community

The local community, patients, and the medical professionals were involved in this study. The hospital's initial survey stated that in the primary care unit, there were thirty nurses, three

psychiatric doctors, five physicians, four social workers, and two psychotherapists. Of the 600 patients who visit the clinic daily, 150 were randomly selected.

Ethics and Human Subject Protection

In order to adhere to the ethical requirements, the consent of the target patients was sought, (see Appendix C). The consent forms duly filled indicated that they participated in the exercise willfully. Similarly, approvals were sought from relevant institutions such as UMASS before the commencement of the study. Confidentiality of participant information was highly considered through the adoption of HIPPA regulation, which is obligatory in Saudi Arabia. In addition, there was no linkage between patient identifications and data collected. The study's objectives and purpose were explained to all participants.

Confidential Agreement and Protection of Human Subjects

A confidentiality agreement is signed by all health care employees on their initial hire and renewed yearly post-completion of a mandatory annual competency. In addition to extra protection with respect to mental illness, a second security lock was installed for all patients with mental illnesses. The lock was opened through a designated management system. The project involved the utilization of the PHQ-2 screening tool to screen for depression in primary care; all patients were given instructions, verbal and written, about the screening process.

There were no human risks to any person involved in this project, and patient participants' identity were kept protected throughout the process by the two tools mentioned above. The entire DNP project was printed without patient identification. Moreover, all the data gathered was kept in the DNP student personal office in a locked cabinet. All participants had signed a consent regarding access to their chart for the auditing and actualization process (see Appendix C). The agreement did not breach any aspect of the Health Insurance Portability and

Accountability Act (HIPPA). The IRB committee at the facility has reviewed and approved the project and sought no human subject involved. In addition, the Human Research Protection Office at University of Massachusetts Amherst found that the project was not considered research under the human subject regulations (see Appendix D).

Implementation Procedure

Step 1: Definition of the Project Objectives and the Primary Goal of Implementation

Needs assessment was conducted following the four major concepts: first decision on the actual size of the project to be implemented and establish the time frame and the primary objective is to establish a screening tool at the primary care clinics. This was to help determine the number of human resources needed for the plan implementation and determining the actual time that the project implementation will take. Secondly, identification of the feasible and measurable objectives of the project, which entails differentiation: between the specific project objectives and the project goals. Thirdly: obtaining the agreement from the various stakeholders to be involved in the project implementation. Finally: development of the methodology for monitoring the project implementation process through the definition of the success indicators important in monitoring the progress (Richman, 2006). All these were done successfully. [See note on the prose in this section.]

Step 2: The Project Team

This step saw the establishment of a project team to assist in plan, preparation, and monitoring the project implementation. Identification of the various tasks required for achieving the set objectives helps in the risk analysis and budgeting for the project, alongside the definition of other primary documents needed in the plan development. Additionally, a backup system was developed to ensure that data was not lost as the project requires daily analysis of the depression

screening process (Larson & Gray, 2011).

Step 3: Identification of the Main Requirements of the Project

This DNP project required software specially designed to match the chosen platform. To match the appropriate software for the project, the designer had to consider the following four main variables: hardware in terms of the equipment cost, ease of upgrade, the total number of the computers required, and the most effective brand, operating system in terms of the license cost, language and ability, access levels, which mainly entails the access grant conditions to the different levels of the stakeholders, and the different information alongside usability requirement in terms of the capacity to access different information and controlling the programs used in the project on depression screening in the primary care (Takewaki, Nakamura, & Yoshitomi, 2012).

Step 4: Development of the Practical Plan for Staff and Members Training

All the personnel and the members required to use the depression screening questionnaire in clinics were trained on how to handle the screening questionnaires appropriately. Training the staff entailed developing a training plan that helped to sharpen their participation and support. Assigning the staff to apply the manual systems in the primary clinics ensured that the daily project progress was in line with the formulated goals of the project implementation (M'ikanatha & Iskander, 2015). The staff and all those involved in the project implementation on depression screening in primary clinics were divided into groups, three to four each, and depended on availability of staff and their workflow.

Step 5: Project Work Plan and Budget

A work plan for the DNP project on depressing screening on primary care clinics was prepared. Similarly, a working budget was prepared to help finance the activities of the project. This project was implemented at a cost of \$40,000.

Step 6: Establishment of a Participatory Monitoring and Evaluation System for the DNP Project

A monitoring and evaluation system was established for the project. This was to help track the project’s activities and the realization of the goals. This step involved the identification of clear and measurable events during the depression screening in the primary care, tasks, and activities that require accomplishment within the defined period of time in order to meet the formulated project standards (Kusek & Rist, 2004). The implementation plan and evaluation system focused primarily on planning issues and the tools involved at various project execution levels. Setting different monitoring standards helps in the evaluation of the project implementation.

Results

Screening was administered to 150 adult patients who attended the clinic with no previous history of mental illness. Out of this population, 52 patients screened positive and were referred for follow-up with the social service and psychiatric departments (Figure 1). This means that 34.6% of the population turned out to be positive although they were not aware they were suffering from such a condition.

Of the 52 positive patients, 40 were females and 12 males (Table 1). As evident in Table 1, there are significantly high ratios of females to males who screened positive for depression.

Table 1

Correlations of Positive Screenings for Depression by Gender

		positive	male	Female
Positive	Pearson Correlation	.a	.a	.a
	Sig. (2-tailed)		.	.
	N	52	12	40

Male	Pearson Correlation	. ^a	. ^a	. ^a
	Sig. (2-tailed)	.	.	.
	N	12	36	0
Female	Pearson Correlation	. ^a	. ^a	. ^a
	Sig. (2-tailed)	.	.	.
	N	40	0	114

Note. a. Cannot be computed because at least one of the variables is constant.

Characteristics of the positive screened population

Most of the women who visited the clinic were of child-bearing age who fell between the age group of 20-40 years (i.e. at 22 against 3 male) (Figure 2). Only 7 females were in the category of 41-55 years, and 9 were above 56 years as illustrated in Table 2.

More married women screened positive (38); only one single woman screened positive for depression.

Table 2

Characteristics of the Positive Screened Population

#	Socioeconomic Characteristics		Female	Male	Total	%
1	Age	<25	2	0	2	3.8
		26-40	22	3	25	48.1
		41-55	7	2	9	17.3
		≥56	9	7	16	30.8
		total	40	12	52	100
2	Marital Status	Married	38	12	50	96.2
		Single	1	0	1	1.9
		Widow	1	0	1	1.9

						100
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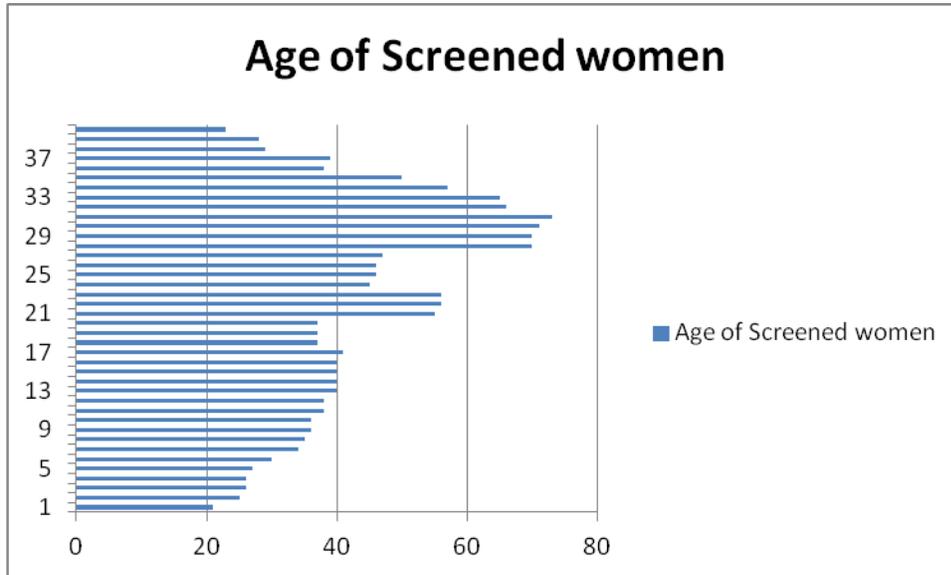


Figure 1: Graph showing the ages of screened women.

Discussion

Screening was administered to 150 adult patients who attended the clinic with no previous history of mental illness. Out of this population, 52 patients screened positive and were referred for follow-up with the social service and psychiatric departments (Figure 1). This means that 34.6% of the population turned out to be positive, although they were not aware they were suffering from such a condition. Although this observation is important, examining the prevalence of depression for the unscreened population percentage itself is alerting. Keeping in mind that a U.S. survey result that included participants diagnosed with a depressive disorder reported that 20.1% of participants had considerably high depression symptoms (Shim et al., 2011) the results were slightly higher than consistent with the national level percentages for depression of 20.1% at 34.5%. This could be due to change in demographic characteristics, time

and living conditions. This indicates that screening is an important tool that can help early detection of depression for easy management in Saudi Arabia.

Gender was determined by self-identification, an item in the written questionnaires. Of the 52 positive patients, 40 were female and 12 were males (Table 1). According to Mulé (2004, p. 1), "women are more susceptible to depression because of gender differences in roles, which have led to differences in the experience of life events." As evident in Table 1, there is a significantly high female-to-male ratio for those who screened positive for depression. Apart from the fact that more females visited the clinic, it could also indicate that more females are in need of the screening services than their male counterparts.

Apart from the 0-25 year old population, prevalence levels of depression were higher than 17% for the older populations. Also, most of the women who visited the clinic were of child bearing age who fell between the age group of 20-40 years at 48% (Figure 2). This indicates that women of reproductive age are more prone to depression than those who are beyond reproductive ages. To explain this trend Kleinberg, Aluoja, and Vasar (2000) found that women displayed an inverse relationship between socioeconomic status and age (Simon, 2002). Simon anticipated that this could relate to the challenges that come during the reproductive age and increasing family responsibilities. Whether or not there is a correlation between child bearing and depression is a subject that requires further investigation.

The study also found that marriage is a predictor of depressive symptoms. This finding differs from Papadopoulos' (2005) finding that indicated older age as a significant predictor of the onset of depression symptoms. However, it relates to a significantly high prevalence in the older generation as in this study. Papadopoulos explained that the cause of the disparities in the correlation between age and depression symptoms relates the far-reaching exogenous factor. He

observed that this was because of the high levels of stressogenic living conditions. It is also important to note that societal changes in value systems and lifestyle plays a big part in accounting for depression symptoms.

For the older generation, including 56 years and above, functional disability and age-related chronic conditions account for the onset of depression symptoms (Jorm, 2000). This means that co-morbidities, poor general health, and chronic conditions account for the decrease in quality of life. Other factors include inadequate social support, retirement, and other socioeconomic factors. Pelzer, Schaffrath, and Vernaleken (2014) found that problems of unemployment and work-related stress impacted mental health and social interaction skills as well as personality and behaviors. All of these are symptoms of deterioration of living conditions.

The findings of the results are inconsistent with those involving unmarried people in Croatia. In Croatia, the highest risk of developing depression symptoms was in the singles or the unmarried group (Inaba et al., 2005, Scarinci et al., 2002). The highest predictor of depression was found to be in individuals who were never married when compared to the divorced, widowed, and other singles. This would clearly mean that differences in the value systems and living conditions plays a role in depression symptoms. Scarinci et al. (2002) explained that people in marriage were emotionally and financially stable and were less likely to be damaged by stress. The finding of this study regarding age and marital status as significant predictors of the onset of depression symptoms differs with findings in different countries.

Even after proper sensitization and education on the need for screening, a small number of patients refused to undergo the screening process. It is usually impossible to categorize whether such people are positive or negative for depression. In essence, it is necessary to

administer the screening process to all patients who visit the clinic for various services. This will help in early identification of such cases for easy management. All positive cases were referred for follow-up with the psychiatric department. The facility administration has approved the policy changes and standard of care for screening.

The project has improved the health status of the population of the city of Dhahran by training nurses and clinicians on the early diagnosis of depression through the utilization of screening tool, which eventually should reduce cases of readmission to health facilities. Moreover, the project has reduced waiting time for seeking medical attention, improved productivity, and reduced cases of readmission to hospital. Concisely, the project has economic and psychophysical benefits for the population.

Whenever patients are readmitted to hospital, they pay a total of \$480 per pay for a bed, meals, and drinks; they also pay \$250 per day for additional nursing care and medications. Self-employed patients lose their daily income of about \$280 per day on average. Readmission involves frequent visits by relatives; as a result, visiting relatives spend \$70 per day per person for each visit; the relative has to lose an additional \$280 per day as he or she has to leave his or her economic activity to attend to the sick. In total, the cost of readmission includes the cost incurred by the patient and the cost incurred by the visitor; the total cost of readmission per day is \$1,297 (citation needed for the data in this paragraph).

This project has served 150 outpatients since its inception, and it is expected to admit 15 patients per month with an average stay of one week for every admission. Consequently, the cost of readmission per patient is \$9,079; 15 readmissions within month totals to \$136,185. When the hospital reduces the readmission rate by 20% due to early diagnosis of depression, the population will save \$27, 237 per month; the amount translates to \$ 326,844 yearly.

Additional training offered to nurses and clinicians is a benefit that can be quantified in monetary terms at a total of \$4,800. There are benefits that cannot be quantified in monetary terms; for example, enhanced quality of life and life expectancy of the population. An estimation of the net gain of the project and increase in life expectancy and quality of life is done by adding the benefits and the intangible value of the project and subtracting the costs of the project (Brent, 2006).

Conclusion

This project found that marriage for large number of women was associated with depression symptoms in Saudi Arabia's population. This is important in the identification of depression symptoms relative to primary healthcare delivery. As demonstrated in other studies, there is a shift in prevalence demographically from older generation to women in marriage. This finding is attributable to the fact that women's health is largely fragmented into general medical care and reproductive care. The fragmented women's health programs mean that healthcare delivery is offered by different providers and could increase the possibilities of poor coordination of screening and, by extension, delivery of primary healthcare. This problem in the structural setup of health care was anticipated by Washington et al. (2003) who predicted that problems inherent in fragmented healthcare delivery systems should signal the need to review health delivery system. This recommendation has been confirmed in this project.

The diagnostic process requires knowledge of depression, ethnicity, environment, and prior health status. Due to a poor diagnostic approach to depression and delayed treatment, patients suffer high morbidity rates, high costs for treatment, and high mortality rates. Untreated depression not only affects the patients and their families but also the community and the economy of the country due to reduction of labor and increased cost towards the health sector.

The outpatient department in Saudi Arabia used in this study now has a PHQ-2 screening tool and is encouraging the people to go for regular checkups to increase early cases of detection to facilitate recognition and treatment for depression. This will offer the greatest chance of recovery; the earlier patients are treated, the greater chance that recurrences can be prevented in the primary healthcare facility since there is lack of a screening protocol or screening tool in the hospital for the identification of cases of depression.

Since the initial stage of treatment is the individual recognizing that he or she is clinically depressed, which is a syndrome of both emotional and physical deviation from just normal everyday sadness, the basic health education should be provided to the community. This is a crucial way to deal with depression since, if one accepts that he or she is depressed, the person can take a step to seek medical attention. The health education can be done by the involvement of many individuals including the local community, doctors, patients, nurses, and hospital management, as well as other medical professionals. Conducting community education and availing the information in social media and online sites pertaining the causes, symptoms, the qualified health care providers and their locations, best practices and prevention from depression is a good way of conducting outreach.

This project has led to the adoption of a routine and systematic screening of depression in all the patients attending the facility. The adopted screening tools are being used in promoting better depression recognition in patients, and therefore, offer them timely treatment among adult patients for a reduction in the harmful effects associated with depression because it keeps a proper record of patients tracking down their medical history to enhance their treatment and attending medical diagnosis regularly. Therefore, the project has both considerable personal and

medical implications for better patient management despite obstacles in implementing screening, such as lack of interpreters to translate and medical team commitment for the screen.

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Appendix A.

Informed Consent

مركز جونز هوبكنز أرامكو الطبي
Johns Hopkins Aramco Healthcare

Consent Form

Please read through the form and ask as many questions as you can before you agree to participate in this project. Kindly keep a copy of this consent form for your records.

Project title:

Screening for Depression in Primary Care Clinic

The study is conducted by: Hadi Taleb

Research supervisor: Dr. Abdul-Razzak Amir

Department affiliation: Outpatient Primary Care Clinic

The purpose of the study:

The purpose of this project is to carry out screening for depression in adult attending primary care clinics at Johns Hopkins Aramco Healthcare.

The reason why you have been invited to participate in this project is?

You have been invited to participate in this study because you are adult patients attending primary care clinics at Johns Hopkins Aramco Healthcare. The intention of this project researcher is to carry out screening for depression cases in adults to enable early intervention.

Procedures:

A procedure for determining your eligibility to participate in this study will be carried out. You will be issued with a study questionnaire by the front desk personnel only if you agree to participate in the study project. You will return a completed form back to the personnel at the front desk. A doctor and a nurse attending you will also have a short face-to-face interview with you that will take approximately 20 minutes.

Risks and Benefits of participating in the project:

There may be risks associated with participating in this project but they have not been identified. The participants in this study will get some indirect benefits and not direct.

Form OCA 15-03



Compensation:

There will no compensation

In case of injury:

In case of injury as a result of participating in this study, treatment such as first aid, emergency treatment and follow-up care will be provided. The payment will for the treatment will be met by Johns Aramco Healthcare and/or your third party i.e. health insurance, among others.

Confidentiality:

All the data collected in the study is considered highly confidential hence will be kept away from unauthorized individuals. In order to avoid privacy violation, the investigators will hide information that may be used by unauthorized persons to identify you in case the report is published. The data and information collected from you will be kept by the researcher in a safe computers installed in locked room. This will ensure confidentiality as only the researchers will have access to the room. Any data or information collected during this study will be store in a password protected computer at the highly protected room. In case of audio interview, the audio will be transcribed to word document before it is completely destroyed. Privacy preserving data mining (PPDM) techniques will be employed to protect data that can be used for your identification by unauthorized individuals. You have the right to withdraw from the project anytime you wish to do so.

Statement of Consent:

I have read through the consent form and understood all it contains information. I am an adult hence I meet the requirement for participation in this study. My questions have been answered satisfactorily. Any future question will be handled by the investigators through a phone using the numbers provided in his from. Therefore, I consent to participate in this study. For the purpose of my records, I will be given a copy of this form.

Signature of Study Participant

Date

Certification of Informed Consent:

I certify that I have explained the purpose and the nature of this project to individual named above, and I have discussed potential risks and benefits associated with participation in this study. I have answered all the questions the individual had concerning the study and we have agreed that I will address any concern he or she may have in the future.

Signature of Interviewer

Date

Appendix B

IRB UMASS



University of Massachusetts Amherst
108 Research Administration Building
70 Butterfield Terrace
Amherst, MA 01003-9242

**Human Research Protection Office
Research Affairs**

Telephone: 545-3428

FAX: 577-1728

MEMORANDUM

To: Hadi Taleb

From: Human Research Protection Office

Date: September 28, 2015

Project Title: Screening for Depression in the Primary Care Clinics in Saudi Arabia

IRB Number: 15-018

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination:

- The activity does not involve research that obtains information about living individuals.
- The activity does not involve intervention or interaction with individuals OR does not use identifiable private information.
- The activity is not considered research under the human subject regulations. (Research is defined as “a systematic investigation designed to develop or contribute to generalizable knowledge.)
- The activity is determined to meet the definition of human subject research under federal regulations, but may qualify for exemption. If uncertain as to whether the scope of the research falls within an exempt category, please contact the HRPO for guidance. Exempt determinations must be made by the IRB.
- The activity is determined to meet the definition of human subject research under federal regulations and is not exempt. The research must be reviewed and approved by the IRB and requires submission of applicable materials.

Information regarding **Types of Review** for human subject research protocols may be found at <http://www.umass.edu/research/irb-guidelines-levels-review>

For additional information, please contact the Human Research Protection Office at 545-3428.

Cc: OGCA