Chapter 2

DEPRESSIVE SYMPTOMS AMONG COMMUNITY-DWELLING MEXICAN ELDERLY

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ABSTRACT

The mood disorders are characterized by alterations in the person´s general emotional state. Depression is one of the most common mood disorders experienced by elderly. Depression in elderly has different characteristics than in other life cycle stages. In the process of aging, physical changes can be confused with depressive symptoms. The physiological changes, psychological, social and environment factors are important for the development of depression. Likewise, depressive symptoms in old age have been associated with morbidity, physical dependence, cognitive impairment and dementia. The aim was to determine the prevalence of depression symptoms and its relationship with socio-demographic factors, cognitive function, co-morbidity and physical disabilities among elderly in a Mexican community setting.

The Inter-institutional Dementia Project in Jalisco (CONACYT 7994) was taken as the basis for this chapter. This is a cross-sectional study, multi-stage, random, and proportional with the participation of n=2,553 community-dwelling elders 60 and older. A battery of assessment was applied during an interview in which different areas were assessed: Depression (30-item GDS), cognitive function (MMSE), functional status (ADL, IADL), chronic medical conditions and vital risk factors (self-report). The questionnaire included also socio-demographic factors. Data obtained were validated and entered into a database. Crude Odds Ratio and confidence interval of 95% were calculated. Logistic regression models tested the relative contributions of demographic variables, diseases and impairments, and general conditions on depression.

It was found a prevalence of 30.9% depressive symptomatology. Mean age of participants was 71.6±8.7 years, mostly women (61.2%). Education level was low, mean was 3.6±3.8 years of education, illiterate 27.2%. 45.5% had no couple, widowed 32.3%, single 8.6%, and divorced 4.6%. Were mainly housewives (41.7%), and 79.2% not pensioners. Functional disability prevalence was 31.5% for IADL, 9.6% in ADL, and 14.3% had cognitive impairment. A mean of 1.5 for chronic diseases was reported. Depressive symptoms were associated in bivariate analysis with being female, cognitive impairment, ADL and IADL disability, co-morbidity, education and being married. Increased age was not related.

These results orient to the necessity of prevention and control of the depression in the primary care and to recognize it as a problem of public health. This study gives us the possibility not only to establish a diagnosis and treatment, but also to promote healthy lifestyles and prevention of depression in older people in order to remain active as long as possible and to improve their quality of life.

INTRODUCTION

The mood disorders are characterized by alterations in person's general emotional state. Depression is one of the most common mood disorder experienced by elderly.

The Diagnostic and Statistical Manual of Mental Disorders DSM-IV defines depression as characterized by a state of deep sadness and loss of interest or pleasure, which lasts for at least two weeks and is present most of the day (American Psychiatric Association, 2002). Consistently, World Health Organization defines depression as a common mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration. These problems can become chronic or recurrent and lead to substantial impairments in an individual's ability to take care of his or her everyday responsibilities (WHO, 2011).

PREVALENCE IN ELDERLY

The WHO considers depression as the most common mental disorder, affecting about 340 million people worldwide. Major depression is a public health problem due to its high morbidity, as 5% of the world population has a depressive disorder. It is the most common psychiatric disorder among the elderly which can manifest as major or as a minor depression characterized by a collection of depressive symptoms.

Like many disorders in most studies, prevalence rates for depression vary considerably depending on the sample studied (community-based, community centers, hospitalized, or nursing home) and methods used (diagnostic criteria: clinical or screening).

In a review it was found a variation range of 1% - 4% for major depression and 11% - 16% for depressive symptomatology (Blazer, 2003). In a study carried on in Utah with non-demented individuals aged 65 to 100 years, the prevalence of major depression determined by DSM-IV criteria was 4.4% in women and 2.7% in men (Stefens, Skoog, Norton, Hart, Tchanz, et al., 2000).

The results are higher when studying the prevalence of depressive symptomatology. In a population study, 27% of older people reported depressive symptoms, 19% were diagnosed as

suffering mild dysphoria, 4% symptomatic depression, 2% dysthymia, 1.2% a mixed depressive and anxiety syndrome, and 0.8% major depression. (Blazer, Hughes, and George, 1987).

In a study conducted in a Brazilian community persons aged 75 years were screened for depression and mental disorders using the General Health Questionnaire (GHQ-12) and Geriatric Depression Scale (GDS), the prevalence of depressive episode was 19.2%, with no effect of gender or age, 9.0% of the elderly presented dysthymia (Costa, Barreto, Uchoa, Firmo, Lima-Costa, et al., 2007).

There have been found differences in depressive symptomatology in urban and rural areas in Kentucky, where urban elderly population reported higher prevalence (54.3%) than rural population (21.9%) (Schulman, Gairola, Kuder and McCulloch (2002), while in the rural area of Malaysia a depression prevalence of 7.6% (measured with GDS-30) was reported in people 60 years and older, the prevalence is higher in people with chronic diseases (9.0%) compared with people without chronic diseases (5.6%) (Mohd Sidik, Mohd Zulkefli and Mustaqim, 2003).

Also there has been studied the difference in depressive symptoms among older people of different races over time, and it was found that is higher in black people with a range from 17.3% to 23.6% compared to the white, 8.8% to 12.2%. in women a higher prevalence than men was found (Skarupski, Mendes de Leon, Bienias, Barnes, Everson-Rose, et al, 2005).

In community centers, a study conducted in Brasilia reported that 31% of elderly suffered depressive symptomatology (measured by GDS-15), and 4% severe depression, all of them aged between 60 and 64 years old (Oliveira, Gomes and Oliveira, 2006), in community centers in Guadalajara Mexico it was found a prevalence of 27.6% among women (Flores Saiffe, and Mendoza Ruvalcaba, 2009).

A special aspect is the prevalence of depression in institutionalized settings, where prevalence increases, in a study conducted in nursing homes in Guadalajara (México), it was found that 64.3% showed depressive symptoms (measured by GDS-30), men 49.6% and women 71.6%, besides it was found an association between cognitive impairment and depressive symptomatology (OR= 3.55, 95% CI= 2.23 – 5.67) (Arias-Merino, Orozco-Mares, and Garabito-Esparza, 2003).

DEPRESSION IN ELDERLY

Depression in older adults differs in both subtle and obvious ways from depression earlier in the lifespan. Presentation, etiology, risk and protective factors, and potential outcomes all reflect aspects of the older adult's position in the lifespan. The knowledge of the ways in which age may alter factors associated with the onset and maintenance of depression is essential for effective treatment of depressed older adults (Alexopoulos, 2005).

A key distinction in discussions of mental disorder in older adults is between those individuals who have already experienced mental illness earlier in life and those whose first encounter with mental illness occurs in old age. The distinction portends differences in etiology and prognosis, but also differences in the lived experience of having a mental illness (Alexopoulos, 2005; Butters, Becker, Nebes, Zmuda, and Mulsant, 2000; Christensen, Jorm, Mackinnon, Korten, and Jacomb, 1999).

The search for specific genes associated with depression in older adults has encompassed both genes studied in the non-geriatric population and genes that might relate to distinctive aspects of late life depression (Chow, Hamagam and, Nesselroade, 2007). Genetic studies in the non-geriatric population have, most of them, focused on the short variant of an insertion/deletion polymorphism located in the promoter region of the serotonin transporter gene (5-HTTLPR). In one of the few extensions of this work to older adults, a significant effect for the A/A genotype of the 5-HTR2A gene promoter polymorphism was found and also depressed mood for older males but not for older females was found. In this study, the 5-HTT serotonin transporter gene was not associated with depressed mood (Gallo, Anthony and Muthén, 1994; Hickie, Scott, Naismith, Ward and Turner, 2001; Jansson, Gatz, Berg, Johansson, and Malmberg, 2002).

Non-genetic biological risk factors for depression are particularly important in old age, mainly because of age-related changes that make these factors more common in older adults. These biological risks include endocrine, inflammatory or immune, cardiovascular, and neuroanatomical factors. Furthermore, biological status may interact with efficacy of treatment (Gallo, Rabins, Lyketsos, Tien, and Anthony, 1997; Gallo, Cooper-Patrick, and Lesikar, 1998).

Not all neurobiological risks have later life origins. For example, earlier-in-life depression may predispose an individual to late-life depression through stress-related hormones leading to reduced secretion of neurotropic factors and decreased neurogenesis (Gallo, Anthony, and Muthén, 1994). Further, depression that appears earlier in life may be a risk factor for vascular disease, which in turn can increase risk of late life depression. This association suggests that these two disorders may share a common pathological process, for example, the serotonin transporter promoter polymorphism 5-HTTLPR associated with depression is also associated with higher platelet factor 4 and beta-thromboglobulin levels, leading to increased platelet activation (Jansson, Gatz, Berg, Johansson, and Malmberg, 2003).

It is well known that late- life depression frequently occurs in the context of medical illness. Although virtually any serious or chronic condition can produce a depressive reaction, the conditions believed to be most strongly associated with depression include cardiac and cerebrovascular disease and neurological conditions, discussed in more detail below. Depression may also be caused by infections or malignancies. Diabetes has been investigated as a risk factor for depression, although recent research suggests that depression may actually be a risk factor for the development of diabetes (Kockler, and Heun, 2002; Tiemeier, 2003).

Depression in older adults may present with some differences than in younger adults. For example, older adults are less likely to endorse cognitive-affective symptoms of depression, including dysphoria and worthlessness/guilt, than are younger adults (Gallo, Anthony, and Muthén, 1994). Sleep disturbance, fatigue, psychomotor retardation, loss of interest in living, and hopelessness about the future may be more prevalent in late-life depression than in depression in younger or middle-aged adults (Gallo, Anthony, and Muthén, 1994; Gallo, Rabins, Lyketsos, Tien, and Anthony; 1997; Gallo, Cooper-Patrick, and Lesikar, 1998). Subjective complaints of poor memory and concentration are also common among depressed older adults. Slower cognitive processing speed and executive dysfunction are frequent findings from objective testing. Overall there do not appear to be substantial differences by gender or ethnicity. Some evidence suggests that older African Americans are less likely to report dysphoria than European-Americans and more likely to report thoughts of death

(Gallo, Cooper-Patrick and Lesikar, 1998). With respect to somatic symptoms, depressed older women report more appetite disturbance than men, whereas older men report more agitation (Gallo, Cooper-Patrick and Lesikar, 1998; Hickie, Scott, Naismith, Ward and Turner, 2001).

Several geriatric-specific variants of depression have been proposed. One variant, reflecting the predominant age differences in presentation, has been called *depression without sadness* or *depletion syndrome*. Another variant is the "depression-executive dysfunction syndrome" (Kockler and Heun, 2002; Tiemeier; 2003). As the name indicates, cognitive performance in this syndrome is typically impaired on measures of verbal fluency, naming, and initiation/perseveration. The syndrome also includes psychomotor retardation and anhedonia but less severe vegetative symptoms, agitation, and guilt than other types of depression.

Depression in the elderly is often associated with anxiety, almost half of depressed older adults have symptoms of anxiety, half of patients with depression have symptoms of anxiety, both are not always presented clearly or simply both disorders are presented together. So that in some older adults with depression may be found some of the features listed for anxiety, and vice versa.

A 70 percent of depressive disorders show anxiety of different grades and types, and an even higher percentage of older adults with anxiety disorders, eventually also present depressive symptoms of varying degrees. The relationship that may arise between anxiety and depression in the elderly, is not fixed and unchanging, in contrast, it shows oscillations along its course, so that over time it is possible the predominance of one or another symptom.

Anxiety is not a prerequisite for the diagnosis of major depression, as listed in DSM-IV (First, Frances and Pincus, 2001) or ICD-10 (WHO, 1994), where the mood and anxiety disorders are recognized as separate and distinct entities. There are guidelines indicating that anxiety is one of the most prevalent symptoms of clinical depression, and that the evaluation and treatment of severe anxiety are of vital importance in the successful treatment of depression.

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On the other hand, anxiety and depression are common in hospitalized older adults, where the prevalence is high especially in women, with no relation to the severity of the disease and it is associated with the patient's subjective perception of greater severity and less improvement (Abuli Picart, Comas Casanovas, Suner Soler, and Grau Martín, 2003; Hansen, Fink, Frydenberg, Oxho, Søndergaard, et al., 2001).

In 50 percent of older adults with depression, the neuropsychological evaluation shows cognitive impairment that may be so intense that it causes a pseudodementia, in which a specific core of cognitive deficits have been identified in to varying degrees in all depressed patients, characterized by poor concentration, poor attention and memory impairment (Steffens, et al., 2000).

And while the most frequent complaint of older adults with depression is the recurrent forgotten memory disturbances these are not the primary feature for differential diagnosis between dementia and pseudodementia by depression.

There are specific points that neuropsychological assessment provides for differentiation. The truth is that depressive states produce diffuse cognitive impairments that affect the visual explicit learning, and a lower affectation in verbal learning and performances (Lopez-Pousa, S., Villalta, J., and Llinas, 1996; Bermejo, 2000).

Early detection of depression, early identification and differential diagnosis between normal aging and changes associated with dementing processes are of great importance for the development of prevention and care interventions that seek to prevent or delay deterioration and disability, which would be more likely in the first symptoms of depression (Vinkers, Gussekloo, Stek, Westendorp, and Van der Mast, 2004).

RISK FACTORS FOR DEPRESSION IN ELDERLY

Among the most common causes of depression can be mentioned: death of spouse and loved ones, loss of employment, discrimination, solitude, isolation, and others but life events should not be considered as the only causes for depression (Kraaij, Arensman, and Spinhoven, 2002). Likewise, depressive symptoms in old age have been associated with morbidity, physical dependence, cognitive impairment and dementia. Also, the institutionalization and hospitalization are increasingly frequent causes of depression.

Risk factors for depression include many of the things that people experience as they get old and not the age itself. There may be present biological factors (genetic and neuro-endocrine factors), psychiatric disorders, family history of depression, personality traits, psychosocial factors and disease.

Lenze, Rogers, Martire, et al., (2001) mention that depression and anxiety disorders are associated with excess disability. They found in a review 16 cross-sectional community studies a significant association between depression and disability in ADLs and IADLs in multivariate analyses, controlling for age, gender, education, income, cognition, physical performance measure, and medical conditions.

In the elderly depression coexists with other medical conditions and disabilities, and may be caused by diseases such as diabetes mellitus, stroke, cardiovascular disease, malnutrition, electrolyte imbalances, anemia, Alzheimer's, Parkinson's and arthritis, among others.

They are also considered as risk factors drug use or combination of drugs (antihypertensive drugs, analgesics, hormones, sedatives, medicines used to treat cancer, among others), social isolation, prolonged economic difficulties, recent bereavement, presence severe or chronic pain, immobility, impaired body image, fear of death, previous history of depression, family history of major depression, previous suicide attempts and substance abuse. (Cyr, 2007; Twedell, 2007; Vázquez-Barquero, 2008).

In Mexico, the elderly present a significant risk for depression due in part to the frequency of chronic degenerative diseases. Lozano, Frenk-Mora, and González-Block (1996) analyzed that in Mexico diseases in the elderly are located in two disease groups: a) those traditionally with high frequency at this age, such as ischemic heart problems, diabetes and cerebrovascular disease, and b) disabling disease, dementia, falls and arthritis. Diabetes Mellitus type 2, continues today in the leading causes of morbidity and mortality in the country followed ischemic heart disease and cerebral vascular disease. Also significant vision

disorders, especially cataracts and glaucoma is reported (Rodríguez-Abrego, Escobedo de la Peña, Zurita, and Ramírez, 2007).

Advanced age as a risk for depression is often taken as a hypothesis. However, controversy exists taking into account the approach of the studies (mainly from cross-sectional and longitudinal). The prevalence of depression is lower in rural areas, and rural residents tend to be older than urban residents. The prevalence of depression is higher in women, however, the number of women increases with age. Depressive symptoms have been associated with social isolation or with less contact with members of their social networks. (Blazer, Burchett, Service, and George, 1991). In an exploratory epidemiological study there was found that age does not constitute a substantial risk for depressive symptoms.

On the other hand, there is evidence that untreated depression in the elderly, has severe complications that worsen the prognosis (Cole, Bellavance, and Mansour, 1999) and double the risk of death (Saz and Dewey, 2001). Several studies indicate that depression is associated with an increased risk of death in some elderly patients with disease. In populations where these findings have been reported include the presence of major depression in older hospitalized patients. Unsurprisingly, the fact is that depression affects more and more older adults and the highest rate of suicide by age occur in people over 70 years (Blazer, 2001).

In addition, the elderly may suicide with less previous attempts (Andraca, 1998) and, interestingly, tend to see a doctor before taking it out (Torres and Vázquez, 2002). Knowing that depression is little diagnosed in the elderly is even less done, with grades of 32-50% underdiagnosis and undertreatment of 37-50% (Cole, Bellavance, and Mansour, 1999; García Solano, 2001). And, despite the existence of clear criteria and a consensus on the management of depression in older adults (Charney, Reynolds, Lewis, Lebowitz, Sunderland, et al., 2003), the diagnosis is not easy, due to its usual atypical presentation and cultural vision of old age as something sad (Herrera Tejedor, 2000).

Other studies show that living alone is associated with depression, and within these, men are the most affected. Institutionalization in nursing homes is associated with factors that favor the appearance of depressive symptoms and can lead to an increased prevalence of this disorder, this is due to the feelings of abandonment, economic hardship, social network and family isolation, changes in lifestyle, stress increase, adaptation to rules that can determine and limit privacy, autonomy, lead to feelings of worthlessness and loss of freedom.

In the elderly, social support networks are important as they may be determining the state of health of the people, lack of support, especially among relatives and poor social support networks accentuate the risk of various psychological disorders such as depression (Pando Moreno, Aranda Beltrán, and Salazar Estrada, 1998). It is well known that the biggest complaint manifested by elderly is the loss of old social roles, and the most widespread disease in this age is depression, which causes are the separation or loss of property, real or fantasized, considered as necessary to satisfy a desire (Salvarezza, 1993).

DEPRESSION ASSESSMENT

The instruments for assessing depression in older people have shown a boom in recent years. Depression can be diagnosed clinically or through the identification of their symptoms, this is an important distinction, because generally studies that focus on symptoms of

depression report much higher prevalence than studies using diagnostic procedures, due to sensibility and specificity of the test. The clinical diagnosis is defined by the DSM-IV and by the ICD-10 (International Classification of Diseases of World Health Organization).

According to the DSM-IV, a person who suffers from Major Depressive Disorder:

A. Must either have (1) a depressed mood or (2) a loss of interest or pleasure in daily activities consistently for at least a two-week period. This mood must represent a change from the person's normal mood; social, occupational, educational or other important functioning must also be negatively impaired by the change in mood. This disorder is characterized by the presence of five (or more) of the following symptoms:

(Symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations must not be included).

1) Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful).
2) Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others).
3) Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day.
4) Insomnia or hypersomnia nearly every day.
5) Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).
6) Fatigue or loss of energy nearly every day.
7) Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).
8) Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).
9) Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

B. The symptoms do not meet criteria for a Mixed Episode.
C. The symptoms cause clinically significant distress or impairment in the social, occupational, or other important areas of functioning.
D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).
E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

Diagnostic criteria for Dysthymic Disorder are also provided by the DSM-IV, they include:

A. Depressed mood most of the day, for more days than not, as indicated either by subjective account or observation by others, for at least 2 years.
B. Presence, while depressed, of two (or more) of the following:

1) poor appetite or overeating
2) insomnia or hypersomnia
3) low energy or fatigue
4) low self-esteem
5) poor concentration or difficulty making decisions
6) feelings of hopelessness

C. During the 2-year period of the disturbance, the person has never been without the symptoms in Criteria A and B for more than 2 months at a time.
D. No Major Depressive Episode has been present during the first 2 years of the disturbance (1 year for children and adolescents); i.e., the disturbance is not better accounted for by chronic Major Depressive Disorder, or Major Depressive Disorder, In Partial Remission.

Note: There may have been a previous Major Depressive Episode provided there was a full remission (no significant signs or symptoms for 2 months) before development of the Dysthymic Disorder. In addition, after the initial 2 years (1 year in children or adolescents) of Dysthymic Disorder, there may be superimposed episodes of Major Depressive Disorder, in which case both diagnoses may be given when the criteria are met for a Major Depressive Episode.

E. There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode, and criteria have never been met for Cyclothymic Disorder.
F. The disturbance does not occur exclusively during the course of a chronic Psychotic Disorder, such as Schizophrenia or Delusional Disorder.
G. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).
H. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

On the other hand, the IDC-10 proposes diagnostic criteria for depression using an agreed list of ten depressive symptoms (key symptoms):

1) Persistent sadness or low mood; and/or
2) Loss of interests or pleasure
3) Fatigue or low energy

At least one of these, most days, most of the time for at least 2 weeks, if any of above present, associated symptoms must be asked:

1) Disturbed sleep
2) Poor concentration or indecisiveness
3) Low self-confidence
4) Poor or increased appetite
5) Suicidal thoughts or acts
6) Agitation or slowing of movements
7) Guilt or self-blame

These 10 symptoms help to define the degree of depression (not depressed, mild, moderate, and severe) and the management is based on the particular degree.

In addition to the clinical criteria, there are several instruments designed for assessing depression, and although some of them were not created specifically for elderly, are widely used.

–   The Beck Depression Inventory, BDI (Beck, Ward, Mendelson, Mock, and Erbaugh, 1961): is a self-report questionnaire composed by 21 multiple choice items and, designed for individuals aged 13 and over, their items are related to symptoms of depression such as hopelessness and irritability, physical symptoms such as fatigue, weight loss, and lack of interest in sex, as well as cognitions such as guilt or feelings of being punished. There are three versions of the BDI, the latest revised and published in 1996. The BDI is widely used by health care professionals and researchers in a variety of settings.
–   The Hamilton Rating Scale for Depression (Hamilton, 1960): Is a test measuring the severity of depressive symptoms in individuals (both children and adults), often those who have already been diagnosed as having a depressive disorder. It must be applied by an interviewer who provides ratings on the different items, based also in information obtained from family, friends and patient record. There are two versions, 17-item and 21-item, both include symptoms like guilt, suicide, insomnia, agitation, anxiety, physical symptoms, among others.
–   Zung Self-rating Depression Scale, SDS (Zung, 1965): is a self-administrated screening tool, a general gauge of depression and mood that rate the four common characteristics old depression: pervasive effect, physiological equivalents, other disturbances, and psychomotor activities. Composed by 20 items scored on a scale of 1 through 4, allows to set levels of depression (normal, mild, moderate, severe), recommended for persons 18 and older.
–   The Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, and Covi, 1974): is a self-report symptom inventory, designed to identify common psychiatric symptoms, scored on five underlying symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, anxiety and depression.
–   Affect Scale Balance: is a 10-item rating scale, containing five statements reflecting positive feelings (interest, pride, satisfaction, on the top, that things are going on the right way) and five statements reflecting negative feelings (loneliness, unhappiness, boredom, upset, concern), which is administered to determine overall psychological well-being at a given point time.

- The CES-D Scale (Sawyer, 1997): is a short self-report scale, designed for use in epidemiologic studies to measure current level of depressive symptomatology in the general population, with emphasis on the affective component and depressed mood. The items of the scale are symptoms associated with depression.
- Geriatric Depression Scale, GDS (Yesavage, 1983): It was developed as a basic screening measure for depression in older adults, composed by 30 dichotomic self-report items. Is commonly used as a routine part of a comprehensive geriatric assessment. A short version of the GDS contains 15 questions; both (GDS-30 and GDS-15) have shown well established reliability and validity. This scale is useful for establishing levels of depression (severe – mild – no depression) and can be used with healthy, medically ill and mild to moderately cognitively impaired older adults.

It is important to emphasize that these tools assess only the presence of depressive symptoms. Therefore, we must be cautious in the use of these scales for clinical diagnosis purposes.

In summary, besides to the high prevalence of depression and the socio-demographic trend characterized with a gradual increase in the older population, depression in older adults acquires a special character. Thus, this requires a greater study in the elderly population, since most research has focused on older adults living in nursing homes.

Given the consequences that this mood disorder can bring to individuals, their families and society in general, such as comorbidity, disability, hospitalization, institutionalization, risk of suicide and even death, it is necessary to establish in our context the prevalence of depression among elderly community-dwelling, as well as factors related to it.

METHOD

Based on the Inter-Institutional Project to Study Dementias in Jalisco, an interview was performed in the State of Jalisco, Mexico, on elderly persons 60 years and older, from January 1st to December 31st, 2005 (Arias Merino et al., 2006). Total population of Jalisco in 2005 was 6,814,808, of which 8.9 % were elderly, according to the National Institute of Statistics and Geography (INEGI, 2005).

A cross-sectional study was designed for persons 60 years of age and older community-dwelling in Jalisco, a state in western Mexico. A total of 2,639 elderly persons were included in a multi-stage, proportional, and randomized sample that included the Metropolitan Area of Guadalajara and 6 municipalities of the State of Jalisco, which were chosen for the following reasons: first, due to the higher concentration of elderly population and second, because this is representative of the socio-economic regions presented by this state.

Maps and lists of potential populations were provided by the INEGI. To carry the survey out in the geographical area, study areas were defined through the National Geostatistics Structure; this system allows relating statistical information to the corresponding geographical space, it divides the national territory in areas of easy identification in the field and it is appropriate for information capture activities. Basic Geostatistical Areas (*AGEB*) were used, which constitute the fundamental unit that adjusts to the municipal and state borders of the country's political-administrative division, as much as possible (INEGI, 2000).

The *AGEB* of the 7 study populations were chosen randomly, and the same was done regarding blocks and homes until finding the study subject. Persons 60 years of age and older who had been living at least one year in the State of Jalisco at the time of the interview were invited to participate in the study if they wanted to do so. If the person was unable to provide information, we asked for the participation of a suitable informant (spouse, son/daughter, or primary caretaker) to carry out the interview, 280 informants mainly son/daughter were used. Of those selected for interview (n=2639), 68 persons were excluded due to insufficient overall, and an additional 18 due to lack of information, resulting in an analysis sample of 2,553 persons. Non-response rate was 10%. (n=261).

A comprehensive interview was applied to examine different items: socio-demographic characteristics, basic and instrumental activities of daily living (ADL and IADL, respectively), cognitive function, depression, and health self-reporting. Although disability is generally treated as a continuous construct, we focus on establishing the disability status.

Depressive symptomatology was assessed using the Spanish version of the Geriatric Depression Scale (GDS) of 30 items (Yesavage, 1983), a cutoff point of 10/11 was considered for depression and non-depression. In our study, an analysis of internal reliability, the GDS showed a Cronbach alpha of 0.89, no significant differences by gender and geographic distribution.

Functional disability was measured in terms of limitations in activities of daily living (ADL), such as bathing, transferring, dressing, toileting, continence, and feeding, using the Katz Index (Katz et al., 1963); not being able to perform at least one of the tasks unassisted was considered a dependence in ADL and a cutoff point was assigned of 5/6 dependent/independent on a dichotomous scale. We assessed the limitations in instrumental activities of daily living (IADL), which included preparing meals, cleaning, laundry, managing finances, managing own medication, ability to use the telephone, going shopping, and the use of transportation) using the Lawton Scale (Lawton, 1969). Since the activities assessed by the Lawton Scale are tasks mainly associated with the female role, the Menendez and San Jose proposal (1995) has been taken into consideration, in regard to the fact that when applying this tool to males the cutoff point be lowered 3 points, considering the mainly female activities, which the males of our culture generally do not perform throughout their lives, regardless of if they are able to do so or not; these activities are: preparing meals, doing laundry, and cleaning the house. Given this consideration, the total score ranged from 0-8 points for women and 0-5 points for men (higher score indicates higher independence). We considered the cutoff point of 7 / 8 for women and 4 / 5 for men (dependence / independence) to convert the variable into a dichotomous variable.

Cognitive impairment was measured using the Spanish version of the Mini-Mental State Examination (Folstein, 1975); a modification of the original was used; in the execution of the series of seven (sequential subtraction of 7 of 100) participants were invited to execute a series of 3s (sequential subtraction of 3 of 30); the MMSE score was calculated using the sum of correct answers (0-30 points), the cutoff point was 19/20 to eliminate the bias of education and culture (Escobar et al. 1986; Teresi et al. 1995; Ramirez, Teresi, Holmes, Gurland and Lantigua, 2006).

Participants were also asked if they had or not a disease diagnosed by the doctor, health conditions included were hypertension, diabetes, cardiovascular disease, cerebrovascular disease, epilepsy, Parkinson´s disease, cancer and cholesterol.

Procedure

The age variable was categorized, for this study, in both five-year groups and as a dichotomous variable (60-74, 75 years and more). In the marital status, the category "lives alone" includes: single, widower, and divorced; while "married" includes: those who live with a partner (married and common law partner). Educational level was categorized by years of education using the following intervals: 0, 1-4, 5-6, more than 7, and as dichotomous variable in 0-4 and 5 years or more. The self-report of disease was entered for each disease event that was diagnosed by the doctor, and that as dichotomous variable was categorized as disease yes/no, where the presence of at least one condition qualified for "disease yes". Occupation (main life occupation) was re-codified by type of effort needed to perform it: physical, mental, and combined (OPS, 2004.); housewife was included as a single category. Occupations included in this physical effort category were: farmer, factory worker, and elementary occupations; mental effort: white-collar worker; and combined effort: craftsman/shopkeeper, and other. Variables were converted into dichotomous for the calculation of the OR: housewife–non-housewife, physical-no physical effort, mental–non-mental effort, combined–uncombined.

Statistical Analysis

Data obtained were validated and entered into a database for analysis.

For describing the socio-demographic characteristics of the sample we used categorical variables, then, we determine the prevalence of depression, cognitive impairment, and disability in IADL/ADL in the sample, as well as a confidence interval of 95% (CI 95%) using standard descriptive methods. Crude Odds Ratio and confidence interval of 95% were calculated by crosstabs. Logistic regression models tested the relative contributions of variables demographics (gender and age), diseases and impairments (cognitive impairment, depression, number of diseases), and conditions (education and marital status) on depression, all variables entered were dichotomized. The models estimated the effects of four sequentially entered blocks of variables: 1) demographics, 2) demographics plus diseases and impairments, 3) the measures in 2 plus conditions, 4) the measures in 3 plus interaction terms. All models were weighted for selection probability and evaluated them by Hosmer and Lemeshow test for assess the goodness-of-fit, and by standard methods to assess significance. Data were analyzed using the Statistical Package for Social Sciences (SPSS 18) for Windows.

RESULTS

It was found a prevalence of 30.9% (29.1–32.7 CI 95%) depressive symptomatology. Among women 35.1% showed depressive symptomatology, 24.2% of men. There were significant differences by gender, age, education, marital status, main occupation during working life, comorbidiy, functional (ADL and IADL) and cognitive status (p<.001).

Chart 1. Participant's socio-demographic and health characteristics

Variable	Non -Depressive symptomatology n= 1765 (%)	Depressive symptomatology n= 788 (%)	Total n= 2553 (%)	p
Gender				
Women	1014 (64.9)	548 (35.1)	1562 (61.2)	<.001
Men	751 (75.8)	240 (24.2)	991 (38.8)	
Age groups, years (Mean= 71.6,SD= 8.7)				
60 – 64	491 (73.6)	176 (26.4)	667 (26.1)	<.001
65 – 69	394 (73.5)	142 (26.5)	536 (21.0)	
70 – 74	309 (70.2)	131 (29.8)	440 (17.2)	
75 – 79	256 (64.6)	140 (35.4)	396 (15.5)	
≥ 80	315 (61.3)	199 (38.7)	514 (20.1)	
Education, years (Mean= 3.6, SD= 3.8)				
0	414 (59.7)	280 (40.3)	694 (27.2)	<.001
1 – 4	679 (66.6)	341 (33.4)	1020 (40.0)	
5 – 6	391 (78.7)	106 (21.3)	497 (19.5)	
≥ 7	281 (82.2)	61 (17.8)	342 (13.3)	
Marital Status				
Single	148 (67.3)	72 (32.7)	220 (8.6)	<.001
Widowed	499 (6.0.6)	325 (39.4)	824 (32.3)	
Divorced	79 (66.4)	40 (33.6)	119 (4.6)	
Married	1036 (74.6)	354 (25.4)	1390 (54.4)	
Main occupation during working life				
Farmer	321 (72.5)	122 (27.5)	443 (17.4)	<.001
Factory worker	217 (77.8)	62 (22.2)	279 (10.9)	
Housewife	661 (62.2)	401 (37.8)	1062 (41.6)	
White-collar worker	85 (82.5)	18 (17.5)	103 (4.0)	
Craftsman / shopkeeper	270 (78.3)	75 (21.7)	345 (13.5)	
Elementary occupations	120 (62.8)	71 (37.2)	191 (7.5)	
Other	91 (70.0)	39 (30.0)	130 (5.1)	
Retired status				
Pension	385 (72.6)	145 (27.4)	530 (20.8)	=.051
No pension	1380 (68.2)	643 (31.8)	2023 (79.2)	
Chronic disease (Mean= 1.5, SD= 1.3)				
0	506 (81.5)	115 (18.5)	621 (24.3)	<.001
1	625 (72.9)	232 (27.1)	857 (33.6)	
2	389 (65.9)	201 (34.1)	590 (23.1)	
3	167 (55.7)	133 (44.3)	300 (11.8)	
≥4	78 (42.2)	107 (57.8)	185 (7.2)	
ADL				
Disability	110 (45.5)	132 (54.5)	242 (9.6)	<.001
Independent	1655 (71.6)	656 (28.4)	2304 (90.4)	
IADL				
Disability	432 (53.7)	373 (46.3)	805 (31.5)	<.001
Independent	1333 (76.3)	415 (23.7)	1748 (68.5)	
Cognitive status				
Impaired	175 (48.1)	189 (51.9)	364 (14.3)	<.001
Normal	1590 (72.6)	599 (27.4)	2189 (85.7)	

SD= Standard Deviation. Chronic disease includes: hypertension, diabetes, cardiovascular disease, cerebrovascular stroke, epilepsy, Parkinson's disease, cancer, cholesterol. ADL= Basic activities of daily living. IADL= Instrumental activities of daily living.

Figure 1 shows participant´s socio-demographics and health characteristics. Mean age of participants was 71.6 ± 8.7 years, ranging from 60 to 104 years of age, mostly women (61.2%). Education level was low; mean was 3.6 ± 3.8 years of education. A significant percentage of the sample was illiterate (27.2%), and 40% only studied 1 to 4 years. In terms of marital status, a sizeable percentage has no couple (45.5%), participants were widowed (32.3%), single (8.6%) or divorced (4.6%). They were mainly housewives (41.6%), which was expected given the women-men ratio. Approximately 8 out of 10 were not pensioners (79.2%).

Chart 2. Socio-demographic and health characteristics associated to depressive symptomatology

VARIABLE	Depressive symptomatology	Non-Depressive symptomatology	OR[1]	CI (95%)[2]
GENDER				
Women	69.5	57.5	1.69	1.41 – 2.02
Men	30.5	42.5		
AGE (years)				
≥ 75	43.0	32.4	1.57	1.21 – 1.53
60 – 74	57.0	67.6		
MARITAL STATUS [3]				
Single	55.5	41.1	1.78	1.50 – 2.11
Married	44.5	58.9		
EDUCATION (years)				
Low (0 – 4)	78.8	61.9	2.28	1.87 – 2.78
High (≥ 5)	21.2	38.1		
HAVING AT LEAST ONE DISEASE [4]				
Yes	85.4	71.3	2.35	1.88 – 2.94
No	14.6	28.7		
COGNITIVE IMPAIRMENT				
Yes	23.7	15.3	1.72	1.39 – 2.12
No	76.3	84.7		
ADL DISABILITY				
Yes	16.8	6.2	3.02	2.31 – 3.96
No	83.2	93.8		
IADL DISABILITY				
Yes	56.6	37.5	2.17	1.83 – 2.57
No	43.4	62.5		
OCCUPATION DURING WORKING LIFE [5]				
Housewife				
Physical	50.9	37.5	1.73	1.46 – 2.05
Combined	32.4	36.8	0.82	0.68 – 0.98
Mental	14.3	18.8	0.72	0.57 – 0.91
	2.4	7.0	0.33	0.20 – 0.35

OR= Odds Ratio, [2] CI= Confidence interval, [3] Single includes people living alone (single, widowed, divorced). [4] Includes at least hypertension, diabetes, cardiovascular disease, cerebrovascular stroke, epilepsy, Parkinson's disease, cancer, cholesterol. ADL= Basic activities of daily living. IADL= Instrumental activities of daily living. [5] Occupations classified according to the type of effort mainly required to perform the activity.

Functional disability prevalence was 31.5% (29.7–33.4, CI 95%) for IADL, 9.6% disability in ADL (8.4–10.7, CI 95%), and 14.3% (12.9-15.7 CI 95%) for cognitive impairment. A mean of 1.5 for chronic diseases was reported by the participants as diagnosed by a doctor; only 1 out of 4 (24.3%) participants remained healthy (without diagnosed chronic disease). Depressive symptoms were associated with socio-demographic and health characteristics. Significant results are shown in Figure 2.

Among socio-demographics factors, gender was found as a risk factor, where women had 1.69 (CI 1.41 - 2.02) more risk than men. Age was a risk factor, the oldest-old were 1.57 (CI 1.3-1.8) times more likely to have depressive symptoms compared with people younger than 75 years. Marital status was also a risk factor, single people had more risk than married (OR = 1.78, CI 1.50 – 2.11). People with less education had 2.28 (CI 1.87 - 2.7) times the risk of depressive symptoms compared to those with a higher educational level. Regarding occupation during working life, housewives had the higher risk, 1.73 (1.46 – 2.05) times the risk of depressive symptoms.

Among health characteristics, elderly with cognitive impairment had 1.72 (CI 1.39 – 2.12) times the risk of depressive symptomatology than those cognitively intact, being dependent on basic activities of daily living (OR= 3.02, CI 2.31 – 3.96) and being dependent on instrumental activities of daily living (OR= 2.17, CI 21.83 – 2.57) were also risk factors, as well as co morbidity OR= 2.35 (CI 1.88 – 2.94).

Depressive symptoms were associated in bivariate analysis with socio-demographic and health characteristics. Variables were entered in blocks, the first of socio-demographic variables (gender and age), the second block included variables related with diseases and impairments, and finally in the third block were added variables related with personal conditions (education and being married). Results are shown in Figure 3.

Chart 3. Adjusted Odds Ratio of depressive symptomatology on socio-demographic and health conditions

Characteristic	Depression			
	Model 1	Model 2	Model 3	Model 4
Gender (women)	1.70 ***	1.28*	0.97	--
Age	1.59 ***	1.10	--	--
Cognitive impairment		1.98 **	1.70 ***	1.71 ***
ADL disability		1.66 ***	1.72 ***	1.73***
IADL disability		1.77 ***	1.63 ***	1.62***
Number of diseases		2.04 ***	2.04 ***	2.04***
Education			1.79 ***	1.79***
Marital status (single)			1.34 **	1.34***
Occupation (housewife)			1.41***	1.39**

*p<.05, **p<.01, p<.001.
ADL= Basic activities of daily living. IADL= Instrumental activities of daily living.

Odds Ratio was adjusted at each step of the analysis to control for potentially confounding factors. Consistently variables such as cognitive impairment, ADL and IADL disability and number of diseases, as well as education, being single and main occupation

during working life (housewife) were risk factors for depressive symptoms. It can be observed that age lost strength and significant value in model 2 and gender in model 3.

CONCLUSION

In this study, the prevalence of depressive symptomatology was 30.9%. Risk factors associated were cognitive impairment, ADL and IADL disability, number of diseases, among those related with diseases and impairments; education, marital status (single), and occupation (housewife) among personal conditions. Age and gender were not risk factors in the adjusted analysis, although they were in the crude analysis.

The coexistence of cognitive impairment and depression in cross sectional studies is identified in various studies (Glasser, Stearns, de Jemp, van Hout, Hott, 1994; Boone, Lesser, Miller, Wohl, Berman, et al., 1994; Arias-Merino, Orozco-Mares, Garabito-Esparza, et al., 2003). In a cohort study it was observed that the risk of cognitive impairment was not associated with concomitant levels of depression after three years, independent of any depressive symptoms at the onset (Dufoil, Fuhrer, Dartigues, and Alperovith, 1996). These results indicate that the association between high depressive symptomatology and poor cognitive function was found in cross sectional studies, showing the importance of adjusting the depressive symptomatology in epidemiological studies in order to measure cognitive function. The findings presented show the coexistence of cognitive impairment, incapacity to perform activities of daily life, and depression.

We also found an association between depressive symptomatology and disability. This contribution of disability (in ADLs and IADLs) to depression –and conversely– suggest a mutually reinforcing relationship. Bruce (2001) offers potential explanations of this issue, the first, argues that disability is a prodromal indicator of underlying physical, cognitive or emotional dysfunction leading to the onset of depression, in its extreme form the argument is that disability is the first observable evidence of a depression; the second, propose that disability is a stressful condition that increases the risk of depression. However the relationship between depression and disability is subtle and complex, alternatively has been suggested that specific depressive symptoms (such as fatigue, sleep disturbance and appetite disruption) have direct debilitating effects resulting over time in functional decline and disability, besides, depression may increase vulnerability to other risk factors for disability, such as medical illness and various life events (Bruce, 2001). Depressive symptoms and disability maintain a reciprocal and potentially spiraling relationship in older adults. The depressed state itself is disabling, and/or depression causes increased disability from other medical conditions, either by increasing the risk of these conditions or by a poorer health behaviors in depressed individuals with these medical conditions (Lenze, et al., 2001).

In our study, marital status was a risk factor, where single people had a higher risk of depressive symptomatology compared with married people, these results are consistent with those reported by Schulman, Gairola, Kuder and McCulloch (2002), where the marital status was significantly different, 18% of married people were depressed in contrast to 37% of the unmarried.

Many of these risk factors can be prevented, Rowe and Kahn (1987) asserts that the effects of aging process itself have been exaggerated, and modifiable factors such as diet, exercise, personal habits and psychosocial factors are underestimated.

Regarding age, in other studies the current prevalence of major depression did not change appreciably with age (Steffens, et al., 2000). Depressive symptoms are more frequent among the oldest elderly, but the higher frequency is explained by factors associated with aging, such as a higher proportion of women, more physical disability, more cognitive impairment, and lower socioeconomic status, when these factors are controlled, there is no relationship between depressive symptoms and age (Blazer, Burchett, Service, and George, 1991).

Among the limitations of this study, it must be considered that this is a cross-sectional study, which limits making assumptions about the progression of depressive symptomatology, besides our findings may be limited by self-report measures that were used. We agree with Blazer and Williams (1980) that it is necessary to take into account that the difficulty of diagnosing depression in older people poses a major threat to epidemiological research, since many of depressive symptoms experienced by the person are attributed to the aging process, illness and even alleged disturbances on the central nervous system.

Finally it is important to emphasize that this results orient to the necessity of prevention and control of the depression in the primary care and to recognize it as a problem of public health.

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