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Prevalence of Depression Among Family Caregivers of Homebound Patients Enrolled in Home Healthcare Public Service in Taif, Kingdom of Saudi Arabia

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ABSTRACT

Background: Family caregivers of a homebound patient encounter a host of problems, e.g., role overload and emotional problems, up to depression and impaired quality of life. Aim: Estimate the prevalence and severity of depression and associated risk factors among caregivers of homebound patients enrolled in home healthcare services at the Home Health Care Center (HHCC), Prince Mansour Military Community Hospital (PMMCH), Taif city, Kingdome Saudi Arabia (KSA). Methodology: The Beck depression scale was utilized to establish aim of the study. Results: The participants' age mean was 47.5± 13.9 years. Female family caregivers accounted for 53.9% (n=163). Up to 21.8% caregivers were mildly depressed, 16.4% were moderately depressed and 4.8% were severely depressed. Risk factors included female sex ($p<0.001$), low education ($p =0.008$), close relation to patients ($p<0.001$) and being serving sickest patients ($p= 0.04$). Only 17 caregivers (10.3%, n=165) sought psychiatric consultation. Conclusion: While depression is highly prevalent among family caregivers of homebound patients, risks related both to the patient and caregiver may influence this disorder, including gender, age, education and patient's disease severity.

KEYWORDS Depression, caregivers, homebound, Saudi Arabia

Introduction

Depression is a major cause of morbidity, worldwide. Part of the known mental health problems, depression is one of the most common diagnostic disorders among patients attending primary health care settings.[1,2] In most countries, too, the number of people who would suffer from depression during their lives falls within an 8% to 12% range.[3,4] ˝Major depressive disorder" (MDD), an alternative to the term "depression" at the clinical settings, similarly describes an all-encompassing low mood condition accompanied by low self-esteem, and by loss of interest in normally enjoyable activities.[5] In some parts of the world, e.g., North America, the probability of having a major depressive episode within a year-long period is 3% to 5% for males and 8% to 10% for females.[3,6] Likewise, the lifetime prevalence varies widely between different world areas, e.g., 3% in Japan and up to 17% in the USA. In the latter, 3.4% of people with MDD do commit suicide, and up to 60% of people who commit suicide have depression (or another mood disorder).[7]

According to the length, severity, and associated psychotic features, if any, MMD may be briefly subtyped as: a) "melancholic", e.g., failure of reactivity to pleasurable stimuli, depressed mood, up to psychomotor retardation, b) "atypical", e.g., mood reactivity (paradoxical anhedonia) and positivity, increased appetite, sleepiness, a social impairment as a consequence of hypersensitivity to perceived interpersonal rejection, and c) "catatonic" (rare, and severest), involving motor and behavioral disturbances (e.g., stupor, either immobility or purposeless bizarre movements), etc. So, symptoms increase with increasing disease severity. In severe cases, patients may suffer symptoms of psychosis, e.g., delusions and hallucinations, usually of an unpleasant nature. Milder symptoms, otherwise, include sleep disorders (insomnia or hypersomnia) and abnormal appetite (decreased or increased). [8] Physically, fatigue, headaches, or digestive problems takes place, especially in developing countries patients. Although MMD may well be diagnosed and treated in the primary care settings, fewer than 25 % of those affected have access to effective treatments.[9,10] Therefore, the World Health Organization (WHO) and the US Preventive Services Task Force (USPSTF) recommend screening for depression for all patients in primary care.[11] From the clinical diagnosis standpoint, the most widely used criteria for diagnosing depressive conditions are found in the American Psychiatric Association's revised fourth edition of the DSM-IV-TR and the WHO International Statistical Classification of Diseases and Related Health Problems (ICD-10), which uses the name recurrent depressive disorder. [7] The approach is based on assessing relevant biological, psychological and social factors that may be impacting on the individual's mood. For instance, the person's current ways of regulating their mood, e.g., alcohol and drug use, is assessed, a mental state examination including mood and thought content, self-harm tendency, absent positive thoughts, etc., all are assessed. [12] Notably, a score on a rating scale alone is not sufficient to diagnose depression, but it provides an indication of the severity of symptoms for a time period, so a person who scores above a given cut-off point can be more thoroughly evaluated for a depressive disorder diagnosis. Several rating scales are used for this purpose and one of them is Beck's Depression Inventory (BDI).[13] In the theme of diagnosis, too, the role of primary care in diagnosing MMD is more marked in areas, e.g., rural districts and developing countries, [13] where specialized psychological care is often scarce.

In practice, depression, a homebound state and caregiving often take place at the same settings and within interrelated circumstances. Consequently, not only a persons who may be homebound, e.g., due to physical disability, such as stroke, Parkinson's disease, or COPD (chronic obstructive pulmonary disease) [8] may themselves develop depression symptoms, but individuals who help them with their activities of daily living (ADL), provide physical and social "caregiving" are also liable to developing MDD.[14]

A "homebound" is unable to leave the home due to an illness, injury, weakness or old age, if he/she experiences a considerable and taxing effort to leave the home and is absent from the home infrequently, for a short duration or if he/she requires the assistance of a device, other persons or special transportation.[15] Such illnesses and disabilities are a major source of distress for family caregivers, compromising their health and well-being.

The negative effects of caregiving increase by increasing severity of the disability of the patient who is being cared for, e.g., functionality, cognitive impairment, problematic behaviors and the care demands engendered by the illness[16].

The word "caregiver" may be prefixed with "family", "spousal" or "child" to distinguish between different care situations, and also to distinguish them definitively from the paid version of a caregiver. [17] For the sake of improving the homebound health-related quality of life, caregivers should have the basic knowledge about patient management plan, infection control standard precautions, and timing of medication and patient critical manifestations. [18] Part of their expected responsibility, caregivers may have to live in the patients' homes; others provide care on a daily or weekly basis. Family caregivers frequently enter into this new role without formal preparation or training.

As a result, they become liable to encountering a host of problems, including role overload, lack of information, financial strains, changes in health status and emotional problems. Eventually, "depression" may develop and progress, jeopardizing the affected caregiver's quality of life. Particularly family caregivers of demented patients and those with and cognitive disabilities are at higher risk of developing depression and medication use.[19] Since its introduction in Saudi, home healthcare (HHC) has been gaining an increasing momentum both at the public - and the national health authority- levels. Many disabled are now candidates for such service, the plenty of whom prefer to receive their home care by family members to gain the social support they need.

Generally, the more demand on HHC the more stressful "side effects" on the part of caregiver. Clinicians do emphasize the observation that homebound patient's distress plays a major role in caregivers' depression, yet little attention has been paid to this construct in studies on family caregiving.[14] On the other hand, evidence that screening improves accurate identification of depression and that treating affected patients can decrease clinical morbidity has been provided.[11] Different prevalence studies on depression, somatoform and anxiety among Saudis at different demographic and community settings[20,21,22] have been conducted. However little, if any, has studied the same among family caregivers of disabled homebound relatives. The current work was built on the hypothesis that family members caring for disabled homebound relatives are at greater risk of developing depression, with a subsequent deteriorating quality of life, depending on the degree of the disability the homebound patient has.

Methodology:

Out of 320 homebound patients catered for by HHCC service at PMMCH the time of the study and who were being attended by a corresponding number of family members for care, a sample of 165 caregivers were randomly selected. The Epi Info SW program [23] was used for sample size (population fraction) "n" calculation, with the following assumptions: a) population size "N" (for finite population correction factor- fpc): 320, b) hypothesized % frequency of outcome factor in the population (P): 30% ±5,[24,25] c) confidence limits as % of 100 (absolute ± %) (d): 5%, d) design effect for cluster surveys (DEFF)=1. A sample size of 161 was obtained and that was rounded up to 165]. A participant could be included in this screening because she or he was 18-60 years of age and living in the same home with the patient. (Non-relative caregivers being paid to provide care were not included). The utilized instrument was a validated Arabic-Language Adaptation of the Beck Depression Inventory (BDI) [26], which included 21 items, each with 5 possible responses' each is assigned a score ranging from zero to four, indicating the severity of the symptoms. A total score of 9 or less indicates no depression, 10- 15 indicates mild depression, 16- 23 indicates moderate depression, 24- 36 indicates severe depression.

A total score of 37 or more indicates a very severe depression. [27] A pilot administration was conducted before data collection and modifications were done based on the pilot testing results. Randomly selected 15 caregivers were identified for the pilot testing. Test-retest reliability was performed. An average correlation coefficient of 0.93 has been obtained. A clearance was obtained from the Research and Ethics Committee, HHCC before the study. Onsite, each participant was informed about the aim of the study prior to the completion of questionnaire. It was made clear that participation was voluntary. We have also stressed the anonymity and confidentiality of any collected information, and that only generic outcome data might be disseminated in scientific settings. A verbal consent from each participant was considered a personal permission to participate in the study. Data were collected and verified by hand, variables coded and then entered to a MS program with adequate backup. All data of interest were in the form of categorical variables (i.e., offered responses to the closed-ended questions that constituted the vast majority of utilized BDI version). The χ^2 test of independence, would be mostly used, unless Fisher's exact was indicated as appropriate, analyzing the strengths of associations between the selected categorical variables. The Statistical Package for Social Sciences (SPSS) software for MS- version-16 was used in the analysis. All tests were at level of significance $\alpha=0.05$; results with *p*-values<0.05 were considered "statistically significant."

Results

The mean age of caregivers serving homebound patients seen by HHCC was 47.5y±13.9, and their ages ranged between 23y and 59years (none was ≥60) (Table 1). Female caregivers barely outnumbered male counterparts (1.2:1.0). Most caregivers (82.4%, n=165) were married, and 39% (n=136) have been doing so for ≥30 years. More than one-half of caregivers (59.4%, n=143) had more than five children, on average. Besides, 66.1% (n=165) of caregivers were also caring for their parents. The majority of caregivers (39.4, n=165) only had basic education (elementary-secondary school), while illiterate and postsecondary candidates accounted for 10.3%, each (Table 1).

Out of 165 caregivers studied, 82 (49.7%) gave history of chronic health problems, e.g., 7.3% had bronchial asthma (BA), 18.3% had osteoarthritis (OA), 29.3% had hypertension (HTN), 32.9% had diabetes mellitus (DM) and 31.7% had other chronic health problems. (Data on >10 different problems were obtained, including complex –and unspecific- complaints, so were not considered for further analysis). The age of homebound patients ranged between 4 and 104 years. These patients have an age mean that is as high as 71.4y±23.6 (Table 2). Male gender was 1.3-times more frequent vs. female's (56.4% vs. 45.6%, n= 165). It has been found that 66.7% (n=165) of patients have had housemaids, 87.3% (n = 110) of whom have been sharing in serving and taking care of the patients (Table 2, footnote).

Health state-wise, it has been shown that 38% (n=165) of homebound patients have had DM with or without complications (Table 3). The remaining homebound-patient population were either bedridden (34.5%) or having chronic disabling health problems, such as cerebro-vascular accidents (CVA) (33.3%), heart diseases (30.9%), aging (21.1%), brain atrophy/cerebral palsy (CP) (9.1%), Alzheimer 7.9%), deafness/blindness (3.6%), or were among the homebound patients diagnosed with "other" health problems (21.1%) (Table 3). (Several patients had a combination of two or more of these diagnoses).

Table 1: Distribution of caregivers by socio-demographic characteristics (n=165).

Characteristic	Characteristic	No.	%
Age in years (165)	≤30 30-49 50-59	19 91 55	11.5 55.2 33.3
	Range (y): 23 – 59 Mean ± SD (y): 47.5±13.9		
Gender (165)	Male Female	76 89	46.1 53.9
Marital status (136)	Married Single Widowed/divorced	136 20 9	82.4 12.1 5.5
Marriage duration (y) (136)*	≤20 20-29 ≥30	56 27 53	41.1 19.9 39.0
Number of siblings** (143)	≤5 >5	58 85	40.6 59.4
Patient's relation (165)	Spouse Parent Offspring Other	30 109 22 4	18.2 66.1 13.3 2.4
Educational level (165)	Illiterate Primary Intermediate Secondary University or above	50 17 22 26 50	30.3 10.3 13.3 15.8 30.3
Income (SR/month) (158)╟	<5000 5000-9,999 ≥10000	53 62 43	33.5 39.3 27.2
Residence (165)	Owned Rented	123 42	74.5 25.5

For married* * Exclude singles* *╟7 Without income*

With respect to the distribution of depression among different demographic criteria caregiver groups (Table 4), 43% of caregivers were scored as being depressed with a variable severity: 21.8% mild depression, 16.4% moderate depression, 4.8% severe depression.

Table 2:- Distribution homebound patients by age and gender of (n=165).

Characteristics	No.	%
Age (years) <30 30-69 70-79 ≥80	(165) 22 28 54 61	 13.3 17.0 32.7 37.0
Range (years) Mean±SD (years)	4 - 104 71.4±23.6	
Gender Male Female	(165) 93 72	 56.4 43.6
Housemaid Available* Unavailable	(165) 110 55	 66.7 33.3

**96/110(87.3%) housemaids participate in the patients care.*

Table 3: Dependence of homebound patients (n = 165)

Activity	Self dependent No. (%)	Partially dependent No. (%)	Completely dependent No. (%)
Food and drink	56 (33.9)	60 (36.4)	49 (29.7)
Changing clothes	15 (9.1)	49 (29.7)	101 (61.2)
Transportation	13 (7.9)	50 (30.3)	102 (61.8)
Going to toilet and bathing	13 (7.9)	53 (32.1)	99 (60.0)
Medication intake	12 (7.3)	23 (13.9)	130 (78.8)

Stratified by age, caregivers' did not show a significant difference in their depression severity status (p>0.05). Moderate and severe depressions were significantly reported among 22.5% and 5.6% of female caregivers, respectively, as opposed to 9.2% and 3.9% of male caregivers, respectively (p<0.001) (Table 4).

Severe depression was more abundant among the lower-educated caregiver groups (illiterate, primary or intermediate levels (10%, 5.9% and 9.1%, respectively), compared to none among the higher educated ones (secondary, university or above) (p<0.01) (Table 4). Stratified by marital status, caregivers did not vary in the frequency reporting severe depression (married 5.9%, single, widowed, divorced, all 0.0%, p>0.05).

Table 4: Distribution of caregivers' depression by selected demographic characteristics

Demographic characteristic	No depression (n=94)	Yes depression (n=71)			χ^2 (p-value)
		Mild (36)	Moderate (27)	Severe (8)	
	No. (%)	No. (%)	No. (%)	No. (%)	
Gender Male (76) Female (89)	 57 (75.0) 37 (41.6)	 9 (11.8) 27 (30.3)	 7 (9.2) 20 (22.5)	 3 (3.9) 5 (5.6)	19.11 (<0.001)
Age <30 (19) 30-49 (91) 50-59 (55)	 12 (63.2) 58 (63.7) 24 (43.6)	 3 (15.8) 18 (19.8) 15 (27.3)	 4 (21.1) 12 (13.2) 11 (20.0)	 0 (0.0) 3 (3.3) 5 (9.1)	16.35 (0.172)
Education Illiterate (50) Primary (17) Intermediate (22) Secondary (26) ≥University (50)	 21 (42.0) 4 (23.5) 15 (68.2) 19 (73.1) 35 (70.0)	 13 (26.0) 8 (47.1) 4 (18.2) 4 (15.4) 7 (14.0)	 11 (22.0) 4 (23.5) 1 (4.5) 3 (11.5) 8 (16.0)	 5(10.0) 1 (5.9) 2 (9.1) 0 (0.0) 0 (0.0)	26.89 (0.008)
Marital status Married (136) Single (20) Widowed/divorced (9)	 80 (58.8) 11 (55.0) 3 (33.3)	 28 (20.6) 4 (20.0) 4 (44.4)	 20 (14.7) 5 (25.0) 2 (22.2)	 8 (5.9) 0 (0.0) 0 (0.0)	6.25 (0.369)
Number of children ≤ 5 (58) >5 (85)	 39 (67.2) 43 (50.6)	 10 (17.2) 23 (27.1)	 5 (8.6) 15 (17.6)	 4 (6.9) 4 (4.7)	5.41 (0.144)
Monthly income <5000 (53) 5000-10000 (62) >10000 (43)	 25 (47.2) 34 (54.8) 34 (79.1)	 10 (18.9) 16 (25.8) 8 (18.6)	 16 (30.2) 6 (9.7) 1 (2.3)	 2 (3.8) 6 (9.7) 0 (0.0)	24.55 (<0.001)

Similarly, the number of siblings among "ever married" was not significantly associated with the depression status, (p>0.05). Moderate and severe depressions were significantly more reported by of caregivers who have low salary (<SR5000/month), compared to that among caregivers who have high salary (>SR10000 /m), respectively (p<0.001) (Table 4). (30.2% and 3.8%, vs. 2.3% and 0.0%, respectively, $p<0.001$). From the standpoint of risk exposure, as represented by homebound patient criteria (Table 5), e.g., severe depression was more common among those serving younger (<30 years) homebound patients compared to that seen among those serving elderly (≥80 years) patients (9.1% vs. 4.9%, $p=0.02$). Also, caregivers serving patients with two or more health problems reported moderate and severe depression more frequently than that among caregivers serving patients with one health problem (21.6% and 8.1% vs. 25% and 5.8%, respectively, $p=0.04$).

Table 5:- Distribution of caregivers' depression by selected homebound patients' criteria (risk factors).

Homebound patient characteristic	No depression (n=94)	Yes depression (n=71)			χ^2 (p-value)
		Mild (36)	Moderate (27)	Severe (8)	
	No. (%)	No. (%)	No. (%)	No. (%)	
Patients' age*					
<30 (22)	12 (54.5)	8 (36.4)	0 (0.0)	2 (9.1)	20.18 (0.02)
30-69 (28)	13 (46.4)	5 (17.9)	10 (35.7)	0 (0.0)	
70-79 (54)	27 (50.0)	13 (24.1)	11 (20.4)	3 (5.6)	
≥80 (61)	42 (68.9)	10 (16.4)	6 (9.8)	3 (4.9)	
# of health problems					
One (76)	52 (68.4)	16 (21.1)	6 (7.9)	2 (2.6)	13.30 (0.04)
Two (37)	15 (40.5)	11 (29.7)	8 (21.6)	3 (8.1)	
>Two (52)	27 (51.9)	9 (17.3)	13 (25.0)	3 (5.8)	
Disease duration (y)**					
≤ 10 (127)	71 (55.9)	25 (19.7)	26 (20.5)	5 (3.9)	7.89 (0.048)
>10 (38)	23 (60.5)	11 (28.9)	1 (2.6)	3 (7.9)	
Housemaid					
No (55)	28 (50.9)	12 (21.8)	10 (18.2)	5 (9.1)	24.29 (<0.001)
Yes, participate (96)	61 (63.5)	23 (24.0)	9 (9.4)	3 (3.1)	
Yes, no participation (14)	5 (35.7)	1 (7.1)	8 (57.1)	0 (0.0)	
Relationship					
Husband/wife (30)	10 (33.3)	6 (20.0)	10 (33.3)	4 (13.3)	31.35 (<0.001)
Father/mother (109)	71 (65.1)	22 (20.2)	15 (13.8)	1 (0.9)	
Son/daughter (22)	13 (50.0)	8 (36.4)	0 (0.0)	3 (13.6)	
Other (4)	2 (50.0)	0 (0.0)	2 (50.0)	0 (0.0)	

*** Depression was not influenced by homebound patients' gender ($\chi^2 = 2.02$, $p = 0.572$).**
**** Depression was not associated with HHC service durations (<1y, 1-3y, 3y) ($\chi^2 = 6.6$, $p = 0.37$)**

Severe depression was significantly more frequent among caregivers caring for patients with disease duration >10y compared to those caring for patients with disease duration <10y (7.9% vs. 3.9%, $p = 0.048$) (Table 5). Another significant difference in this risk-outcome analysis in the frequency of severe depression among caregivers stratified by whether or not a housemaid participating in serving patients was available was obtained (9.1% vs. 0.0%, $p<0.001$). Severe depression, too, was more reported if a patient was a spouse or a child of the caregiver than that if she or he was a parent of the caregiver (13.3% and 13.6% vs. 0.9%, $p<0.001$) (Table 5).

Table 6 displays the relationship between the dependence status of homebound patients and caregivers depression. Significantly, 10.2% of caregivers whose patients were completely dependent regarding their food and drink reported severe depression vs. only 3.6% of those whose patient were self-dependent doing the same ADL ($p=0.02$) (Table 6).

Table 6: Depression among caregivers by dependence of homebound patients

Homebound patient dependence	No depression (n=94)	Yes depression (n=71)			χ^2 (p-value)
		Mild	Moderate	Severe	
	No. (%)	(n=36) No. (%)	(n=27) No. (%)	(n=8) No. (%)	
Food and drink Self dependence (56) Partial dependence (60) Complete dependence (49)	26 (46.4) 40 (66.7) 28 (57.1)	11 (19.6) 13 (21.7) 12 (24.5)	17 (30.4) 6 (10.0) 4 (8.2)	2 (3.6) 1 (1.7) 5 (10.2)	16.91 (0.010)
Changing clothes Self dependence (15) Partial dependence (49) Complete dependence (101)	8 (53.3) 26 (53.1) 60 (59.4)	0 (0.0) 11 (22.4) 25 (24.8)	7 (46.7) 9 (18.4) 11 (10.8)	0 (0.0) 3 (6.1) 5 (5.0)	15.23 (0.02)
Transportation Self dependence (13) Partial dependence (50) Complete dependence (102)	9 (69.2) 26 (52.0) 59 (57.8)	0 (0.0) 11 (22.0) 25 (24.5)	4 (30.8) 10 (20.0) 13 (12.7)	0 (0.0) 3 (6.0) 5 (4.9)	7.39 (0.287)
Going to toilet and bathing Self dependence (13) Partial dependence (53) Complete dependence (99)	9 (69.2) 26 (49.1) 59 (59.6)	0 (0.0) 14 (26.4) 22 (22.2)	4 (30.8) 10 (18.9) 13 (13.1)	0 (0.0) 3 (5.7) 5 (5.1)	7.60 (0.269)
Medication intake Self dependence (12) Partial dependence (23) Complete dependence (130)	7 (58.3) 12 (52.2) 75 (57.7)	0 (0.0) 4 (17.4) 32 (24.6)	5 (41.7) 4 (17.4) 18 (13.8)	0 (0.0) 3 (13.0) 5 (3.8)	12.65 (0.049)

The same trend was observed regarding both changing of clothes and medication intake (5% vs. 0.0% severe depression, $p=0.02$, and 3.8% vs. 0.0%, $p=0.049$, respectively) (Table 6). Patient transposition, as well as going to toilet/bathing otherwise was did not significantly influence the development of depression among the study's caregivers.

Regarding those risks, i.e., ongoing social problems between the caregivers and individuals in the surrounding circle, e.g., the spouse, children, parents, relatives, work friends, as well as the presence of any chronic health problem among the caregivers themselves, all as independent factors (Table 7), significant relationships between all such individual variables and caregivers' depression statuses have been found. For instance, depression, regardless its severity, was reported among 9(81.8%), 12 (100%), 2 (100%), 4 (66.7%) and 3 (50%) of caregivers who had problems with their spouse, son/daughter, parents, relatives or friends, respectively, compared to 49 (38.3%), 44 (34.4%), 37 (37.9%), 67 (42.1%) and 12 (21.8%) of caregivers who had no problems with counterpart individuals ($p<0.05$) (Table 7). Further, moderate and severe depression were significantly higher when a history of a chronic medical problem has been reported, compared to the situation when such history has been denied (22.5% and 7.5%, vs. 10.6% and 2.4%, respectively, $p<0.001$). In addition, a small number of caregivers (17/165 = 10.3%) were interested in seeking psychiatric consultation. Should this has been thought of, it only happened since 6 months or more by most involved caregivers (12/17= 70.6%).

Table 7: Depression among caregivers by surrounding social problems, and caregivers' health status

Social problems with:	No depression (n=94) No. (%)	Yes depression (n=71)			χ^2 (p-value)
		Mild (36) No. (%)	Moderate (27) No. (%)	Severe (8) No. (%)	
Spouse					
Yes (11)	2 (18.2)	6 (54.5)	3 (27.3)	0 (0.0)	11.37
No (128)	79 (61.7)	24 (18.8)	17 (13.3)	8 (6.3)	(0.01)
Child (son/daughter)					
Yes (12)	0 (0.0)	9 (75.0)	1 (8.3)	2 (16.7)	27.03
No (128)	84 (65.6)	21 (16.4)	17 (13.3)	6 (4.7)	(<0.001)
Parent					
Yes (2)	0 (0.0)	0 (0.0)	2 (100.0)	0 (0.0)	15.04
No (124)	77 (62.1)	29 (23.4)	13 (10.5)	5 (4.0)	(0.002)
Other relative					
Yes (6)	2 (33.3)	2 (33.3)	0 (0.0)	2 (33.3)	12.43
No (159)	92 (57.9)	34 (21.4)	27 (17.0)	6 (3.8)	(0.006)
Friends					
Yes 6)	3 (50.0)	0 (0.0)	3 (50.0)	0 (0.0)	15.85
No (55)	43 (78.2)	7 (12.7)	2 (3.6)	3 (5.5)	(<0.001)
Caregiver's medical problem					
Yes (80)	31 (38.8)	25 (31.3)	18 (22.5)	6 (7.5)	21.21
No (85)	63 (74.1)	11 (12.9)	9 (10.6)	2 (2.4)	(<0.001)

Discussion

Three components constitute the cornerstone of this work: being homebound with a disability, caregiving for such homebound disabled, and the risk of depression among those caregivers. In Saudi, little studies, if any, integrating such risks with the likelihood of depression family caregivers may develop, caring for their homebound patient relatives, are available. A screening approach [11,28] adopted by this work utilizing, BDI [26] was most appropriate both for the study aim and setting. In its current version, the questionnaire provides most tools required to achieve the study community-based goal in as efficient and economic way. An aim was that to extract valid and reliable data about the Saudi caregivers' conceptualization, thoughts, cognition and suffering in face of the moral obligations they are devoting to their loved homebound patients, an objective that the Beck's depression inventory largely dedicated to [29,30,31]. The items contained by far match, e.g., our population's age relevant symptoms of depression (such as hopelessness and irritability, cognitions such as guilt or feelings of being punished, as well as physical symptoms. [32] A conservative estimate reports that 20% of family caregivers suffer from depression, twice the rate of the general population. [33] In the current study, depression; regardless its severity was reported among 43% of the caregivers. In the Schulz and collaborates' study, [19], 41% of former caregivers of a spouse with Alzheimer's disease or another form of dementia experienced mild to severe depression up to three years after their spouse had died. [19] The findings are consistent with earlier research [34] which revealed that caregivers reported depression even more than the affected persons themselves. It is unclear whether this variation reflects methodological differences in study designs and instruments or true differences in prevalence. Several efforts have been paid to improve early detection of depression, develop programs to prevent and treat as soon as possible. [35] Because of the high prevalence of caregiver depression, and its potential association with adverse outcomes, clinicians should have a high index of suspicion for depression in their patients who care for family members with dementia. [36,37,38] While little research has focused specifically on the treatment of depression associated with caregiving, it seems likely that pharmacologic and non-pharmacologic treatments that are effective in general groups of people with depression should also be effective in caregivers with depression. Furthermore, some evidence suggests that interventions focused on caregiver support may reduce rates of caregiver depression and burden, as well as rates of nursing home placement. [39] In general, women caregivers experience depression at a higher rate than men. [33] In accordance with that finding, in the present study, the prevalence of depression among female caregivers was significantly higher than male caregivers, ($p<0.001$). Females are more likely to be depressed than males because the extensive gender and generational asymmetries in a joint family system are likely to put females at a particular risk of non-support, especially in the face of changes that degrade the family's traditional system of care. [40] Our findings with respect to caregiver characteristics further demonstrate that caregiver depression is a complex interplay of medical, social, and economic factors. Both male and female spouses had high levels of depression. Both the health (as measured by history of chronic diseases) and economic resources (as measured by income) of caregivers may very well help anticipate the risk of depression. Both physical and economic health probably decreases the stresses of caregiving. Caregivers with better health are probably more able to withstand the physical demands of caregiving. Caregivers with higher income probably have more access to supportive services like home healthcare aides and adult day care that may help minimize the burdens of caregiving. Patient characteristics that associated caregiver depression included younger patient age, more chronic health problems, more functional dependence and longer duration of diseases. Quite similar findings have been reported by Covinsky, et al. [36] Caregiver characteristics associated with depression included low levels of financial resources (income), lower education, the relationship to the patient (son/daughter or husband/wife), social problems (our findings suggest that dysfunctional marital and other social relationship may indicate a high risk for depression) and poor caregiver health status. This finding was supported by results from other studies. [36,41,42,43] By demonstrating that all of these factors must be considered to understand caregiver depression, results of the present study demonstrate that caregiver depression can only be understood by a complete understanding of both the patient and caregiver, and their cultural context. Wilkins et al, 2009 [44] reported that while many caregivers who were already providing tasks expressed interest in training, there were other caregivers who were interested in training even though they were not currently assisting their family member through that particular task. This may be for a number of reasons, for example, wanting to provide better care to their family member, wanting to feel more competent or confident in their assistance, or even preparing and anticipating caregiving needs that they would like to provide in the future. This is a heartening finding since perceived caregiving competence and tangible support from health care professionals have been associated with optimum family caregiving, despite caregiving burden. [44,45] The results have implications for further care and support of the elderly homebound patients in KSA. This is especially in area of the provision of intervention and educational programs for current, as well as future caregivers. Studies by Benekengenaamd Kolmer, et al [46] found that such intervention and educational programs can help reduce misconception about the reason of caregiving which sometimes lead to caregivers not giving appropriate care. Like other common problems related to aging (in the current study, 69.7% of homebound patients were over 70), caregiver depression is therefore best approached by viewing it as a problem induced by the interactive effects of multiple risk factors, rather than a problem induced by any single dominant risk factor. This suggests that efforts to identify and treat caregiver depression will need to be multidisciplinary, consider the cultural context of the patient and caregiver, [37] and focus on multiple risk factors, simultaneously.

Our study has several strengths. It is unique of its kind in KSA, making it one of the important studies of caregiver depression. We considered a diverse array of social, patient, and caregiver characteristics that could plausibly influence depression, and our considerable sample size made it likely that we could identify clinically important effects. However, our study also has some limitations. First, the generalizability of our findings is uncertain because we studied caregivers for homebound patients enrolled in HHCC. However, this impact on generalizability is balanced by the diversity of our patients (age, gender and disease status). Second, our measure of depression was the BDI and not a DSM-IV diagnosis of depression. Third, we only interviewed one caregiver per patient. In many cases, patients may have more than one caregiver, and dynamics between the caregivers may have impacts on caregiver depression. Finally, many of the independent variables were based on caregiver reports and it is possible that these reports may have been influenced by depression itself. For example, depressed caregivers may be more likely to overestimate the physical limitations of the patient and the extent to which patient behaviors are considered problematic and underestimate the patient's health-related quality of life.[47] This tendency, together with the cross-sectional nature of the study makes it difficult to differentiate whether some variables influence caregiver depression versus whether caregiver depression influences the reporting of these variables. Eventually, while most of these factors have been demonstrated to be associated with caregiver depression in other studies, this work is one of the few to have considered all of these factors in a single study. In conclusion, depression is a highly prevalent disorder among family caregivers of homebound patients enrolled in HHCC. It is a complex clinical and social problem, influenced in part by multiple patient and caregiver characteristics, such as age, level of education, gender, income, patients' health problems, presence of housemaid, as well as social and medical problems of caregivers.

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