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Research Article

### PREVALENCE AND RISK FACTORS OF DEPRESSION IN THE ELDERLY NURSING HOME RESIDENTS IN SAUDI ARABIA

**Running Head:** Elderly nursing home residents and depression.

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**Abstract:**

***Objectives:** to understand the prevalence and risk factors contributing to elderly Nursing Home (NH) residents' depression in Saudi Arabia*

***Methods:** a cross sectional study, 10 out of the 13 Saudi provinces were enrolled with 580, 132 residents completed the questionnaire, 73 of them were males, and 59 females, answering 3 part questionnaire revolving around demographic makeup, physical assessment using the activity of daily living questionnaire (ADL), cognitive function assessment and depression severity using the geriatric depression scale (GDC).*

***Results:** over 50% of the participants results show mild to severe depression compared to their peers. chronic comorbidities residents were more depressed (68.8%) vs (31.3%) than others with less chronic diseases, shorter length of stay is associated with higher depression prevalence (75%) vs (25%), residents with previous history of depression showed recurrent episodes (64.6%) vs (35.4). No significant statistic presented between depression and cognitive function, financial status, sex, visitations, or sleep disturbances.*

***Conclusion:** the high prevalence of depression among elderly is an alarming finding that need to be managed and more taking care of by the health care system in Saudi, specially that we lack a lot of studies and data on this subject.*

***Keywords:** Elderly, Depression, Nursing home, Activity of daily living, Geriatric depression score, cognitive function.*

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**BACKGROUND:**

Saudi Arabia showed a lower rate of depression 17.5% among elderly in private households in comparison to other countries <sup>(1)</sup> however, in the kingdom the data are scarce on the extent of depression among elderly in nursing homes and very few had been conducted in Arab countries <sup>(2)</sup> in the eye of society, nursing facilities are considered as a house for abandoned or unwanted old people which contrasts with our culture and religious belief and that explains the scantiness of the institutions <sup>(3)</sup> Almost all the people who live in the homes have no family or financial support <sup>(4)</sup> Hence. The kingdom has lack of studies among those groups of people; the aim of the present study is to assess the extent of depression and the risk factors in order to provide better quality of life for them.

The increase of elderly's Population is a global phenomenon <sup>(5)</sup> and Saudi Arabia is no difference with predicted increase up to 25 % of the total population by the end of 2050 <sup>(6)</sup>. Depression is a common disease in later life <sup>(7, 8)</sup> the prevalence of depressive symptoms among elderly varied between 7.2% and 49% <sup>(7)</sup> and it's well known that elderly in nursing homes suffer from higher degree of depression than those who live in the community <sup>(8, 9,10, 11,12,13)</sup> it's the most prevalent mental illness in the nursing homes <sup>(14)</sup> and mostly under diagnosed and treated <sup>(12,14)</sup>. Which shouldn't be taking slightly, 12 months follow-up study done in Norway had found out that elderly who died in NHs were more depressed than the survivors <sup>(15)</sup> and many studies indicated a relation between depression and the increase of both mortality and morbidity rate <sup>(2, 8,7, 14,15)</sup> it also had been proven that chronic medical illnesses are risks developing depression <sup>(10)</sup> while few studies indicated that depressed patients with better physical health in NHs were more depressed than those who had chronic diseases, they stated that to the possibility of receiving more care and attention from the staff due to their other illnesses <sup>(14,15)</sup> however there was a case-control study had been done in Egypt between two groups suffer from depression in NHs, one was control while the other had comorbid medical conditions, the result showed no significant difference between the two groups regarding their depressive symptoms <sup>(12)</sup> and few other studies suggested no relation as well <sup>(8,11)</sup> It has been found that there's an association between increase of age and depression <sup>(16)</sup> while other studies in both developed and developing countries had reported no significant relation <sup>(17,18)</sup> there're many studies had linked between depression and women <sup>(9,10, 17,18)</sup> its also been found in a national study among Saudi elderly population that depression was

higher among female <sup>(19)</sup> however a recent study had been conducted in the Eastern Province of Saudi Arabia reported 42.1% prevalence of depression among Elderly Women Attending Holy Quran Memorization Centres which was higher than the national figure. Nonetheless, some studies in NHs found no significant association between depression and gender <sup>(8,11,12)</sup>. Meanwhile a study in Ohio state, USA had reported 'being female' as a depressive factor in intuitional environment <sup>(14)</sup>

There are many factors associated with depression in elderly, some of them are specific for NHs residents e.g. length of stay. A lot of studies associated longer length of stay and depression <sup>(11)</sup>, in the meantime others had linked it to a shorter period of residency and the theory behinds it was that elderly were facing difficult time adopting their new environment <sup>(15,20)</sup> being single was usually considered a risk factor for depression in household <sup>(21)</sup>, but it was found that it played a minimal role among depressed patients in nursing homes and elderly in general <sup>(15,17,20)</sup> in contrast the number of visitors and lack of social contact were significantly associated with depression in many NHs. <sup>(8,11,15)</sup> Cognitive impairment is very common among elderly population locally and internationally <sup>(1,19, 22)</sup> however, the prevalence of poor cognitive function in NHs are higher than the population in the community <sup>(22)</sup> and yet its not fully understood if depression was a risk factor or a cause of poor cognitive function <sup>(1)</sup> both presence or absence of the association between cognitive impairments and depression had been reported either in the community or institutions <sup>(1,2,8,10,11,15, 17,20)</sup> Another study had been conducted in Jordan found that patients who were more depressed had more physical disabilities in NHs <sup>(2)</sup> while many others had associated depression with history of previous depression, pain <sup>(8,11)</sup> sleep disturbance <sup>(24)</sup>.

**METHODS:****Study design:**

A cross sectional study.

**Setting of the study:**

A structured questionnaire was conducted among elderly nursing home residents in all nursing homes in Saudi Arabia. Ten out of thirteen Saudi regions possess an elderly NH with a total number of 580 geriatric residents NHs operate on a single-gender basis, except the one in wadi aldawasir which only contains male NH. The data were collected during September 2019 till March 2020.

A structured questionnaire was taken from previous studies and edited to suit the objectives <sup>(11,19)</sup>. The

questionnaire (Appendix 1) contained three parts. The first part consisted of demographic features. The second part was designed to assess the risk factors of depression. It included 7 direct questions, and additional two questions to assess physical activities by using Activities of Daily Living (ADL) score<sup>(19,25)</sup> and cognitive function by using The Mini Mental State Examination (MMSE)<sup>(19)</sup>. The last part was to determine the severity of the residents' depression by using geriatric depression scale (GDS).<sup>(19)</sup> A pilot study was conducted to test logistics of data collection, suitability / clarity of data collection tools and estimation of timing for data collection. A verbal informed consent was obtained from the participants before answering the questionnaire.

Collected data was tabulated and analysed by using

SPSS software (SPSS Inc, ! Chicago, IL.) with a level of significance of  $P < 0.05$  and Chi squared.

### RESULTS:

Of the 580 nursing home residents, only 132 could be interviewed to fill out the questionnaire (response rate 22.6%). the others couldn't respond verbally, as they were either bed ridden and intubated, mentally ill, or aphasic (post stroke residents), few refused to participate<sup>(14)</sup>. The respond rates in the 10 provinces from the heights to lowest were; joof (57,6 %), Qassim (55%), Eastern province (34%), Wadi adwasser(26.6%), Taif( 25%), Madinah (24%), Jezan(22.8% ), Abha(20.6%), Riyadh(14%), and Makkah (12%), (Chart 1).

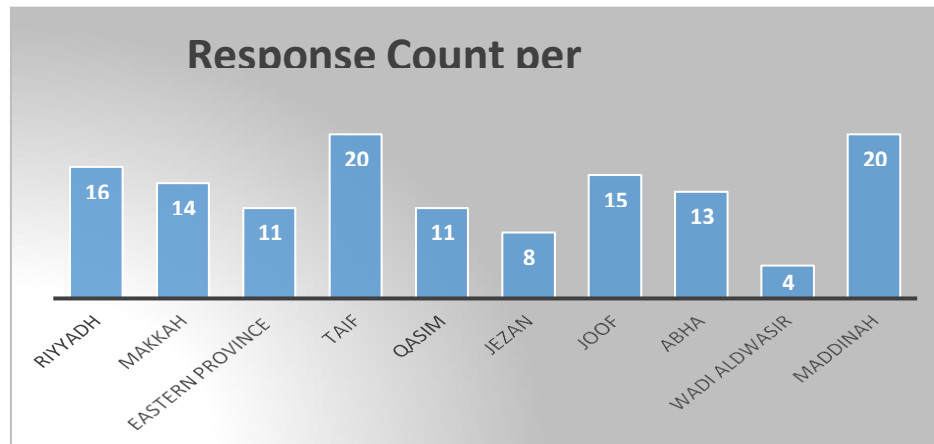
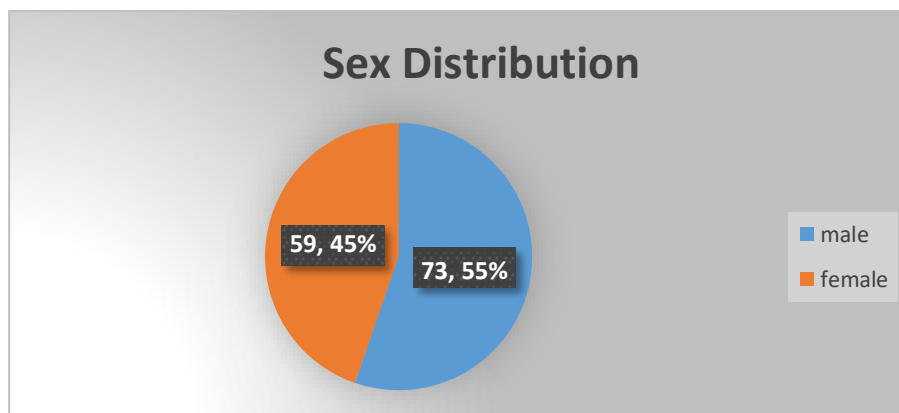


Chart 1: Questionnaire response count per provinces.

The sex distribution of the sample was 55.30% male and 44.70% female (chart 2). With Almost three quarters of the residents were 61-year-old and above, 65.9% were either illiterate or had informal education and more than half of them haven't had a partner in their lifetime. 80% suffered from at least 1 chronic disease. More than half(51.5%) of the elderlies suffered from mild to severe depression, 64% of them were above 80-year-old and mostly women. however, weren't statically significant.

Chart 2: Participant sex distribution.



There was a statically significant association between level of depression and other depressive factors such as chronic diseases, Length of stay, history of depression, and financial support. Elderly with chronic diseases found to be more depressed than medically free residents (table 1) and those who just got into the institutions were more depressed than the ones who stayed for longer period (more than 5 years), (table 2). Also non-depressed elderly were more likely to have no history of depression (table 3), however those with no financial support were more depressed (table 4).

No significant associations were found between level of depression and sleep disturbance (table 5), visitation frequency (table 6), physical activities (table 7), and cognitive function (table 8).

**Table 1:**  
**Level of depression (GDS) \* Number of chronic conditions**

**Crosstab**

		Number of chronic conditions				Total
		"1 - 2"	"3 - 4"	>5	0	
Level of Normal depression (GDS)	Count	33	10	2	19	64
	% within Level of depression (GDS)	51.6%	15.6%	3.1%	29.7%	100.0%
	% within Number of chronic conditions	47.1%	31.3%	50.0%	73.1%	48.5%
	% of Total	25.0%	7.6%	1.5%	14.4%	48.5%
Mild or Severe depression	Count	37	22	2	7	68
	% within Level of depression (GDS)	54.4%	32.4%	2.9%	10.3%	100.0%
	% within Number of chronic conditions	52.9%	68.8%	50.0%	26.9%	51.5%
	% of Total	28.0%	16.7%	1.5%	5.3%	51.5%
Total	Count	70	32	4	26	132
	% within Level of depression (GDS)	53.0%	24.2%	3.0%	19.7%	100.0%
	% within Number of chronic conditions	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	53.0%	24.2%	3.0%	19.7%	100.0%

**Chi-Square tests:**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.155 <sup>a</sup>	3	.017
Likelihood Ratio	10.473	3	.015
N of Valid Cases	132		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 1.94.

**Table 2:**  
**Level of depression (GDS) \* Length of stay**  
**Crosstab**

			Length of stay				Total
			< 6 months	> 5 years	2-5 years	6months - 2years	
Level of depression (GDS)	Normal	Count	1	42	14	7	64
		% within Level of depression (GDS)	1.6%	65.6%	21.9%	10.9%	100.0%
		% within Length of stay	25.0%	61.8%	42.4%	25.9%	48.5%
		% of Total	.8%	31.8%	10.6%	5.3%	48.5%
Mild or Severe depression		Count	3	26	19	20	68
		% within Level of depression (GDS)	4.4%	38.2%	27.9%	29.4%	100.0%
		% within Length of stay	75.0%	38.2%	57.6%	74.1%	51.5%
		% of Total	2.3%	19.7%	14.4%	15.2%	51.5%
Total		Count	4	68	33	27	132
		% within Level of depression (GDS)	3.0%	51.5%	25.0%	20.5%	100.0%
		% within Length of stay	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	3.0%	51.5%	25.0%	20.5%	100.0%

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.671 <sup>a</sup>	3	.009
Likelihood Ratio	12.013	3	.007
N of Valid Cases	132		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 1.94.

**Table 3:**  
**Level of depression (GDS) \* Known history of depression**  
**Crosstab**

		Known history of depression		Total
		No	Yes	
Level of Normal depression (GDS)	Count	47	17	64
	% within Level of depression (GDS)	73.4%	26.6%	100.0%
	% within Known history of depression	56.0%	35.4%	48.5%
	% of Total	35.6%	12.9%	48.5%
Mild or Severe depression	Count	37	31	68
	% within Level of depression (GDS)	54.4%	45.6%	100.0%
	% within Known history of depression	44.0%	64.6%	51.5%
	% of Total	28.0%	23.5%	51.5%
Total	Count	84	48	132
	% within Level of depression (GDS)	63.6%	36.4%	100.0%
	% within Known history of depression	100.0%	100.0%	100.0%
	% of Total	63.6%	36.4%	100.0%

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.157 <sup>a</sup>	1	.023	.030	.018
Continuity Correction <sup>b</sup>	4.368	1	.037		
Likelihood Ratio	5.215	1	.022		
Fisher's Exact Test					
N of Valid Cases	132				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.27.

b. Computed only for a 2x2 table

**Table 4:**  
**Level of depression (GDS) \* Financial support**  
**Crosstab**

		Financial support		Total
		No	Yes	
Level of Normal depression (GDS)	Count	26	38	64
	% within Level of depression (GDS)	40.6%	59.4%	100.0%
	% within Financial support	40.0%	56.7%	48.5%
	% of Total	19.7%	28.8%	48.5%
Mild or Severe depression	Count	39	29	68
	% within Level of depression (GDS)	57.4%	42.6%	100.0%
	% within Financial support	60.0%	43.3%	51.5%
	% of Total	29.5%	22.0%	51.5%
Total	Count	65	67	132
	% within Level of depression (GDS)	49.2%	50.8%	100.0%
	% within Financial support	100.0%	100.0%	100.0%
	% of Total	49.2%	50.8%	100.0%

#### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.691 <sup>a</sup>	1	.055		
Continuity Correction <sup>b</sup>	3.052	1	.081		
Likelihood Ratio	3.709	1	.054		
Fisher's Exact Test				.058	.040
N of Valid Cases	132				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.52.

b. Computed only for a 2x2 table

**Table 5:**  
Level of depression (GDS) \* History of Sleep disturbance

## Crosstab

			History of Sleep disturbance		Total
			No	Yes	
Level of Normal depression (GDS)	Count	42	22	64	
	% within Level of depression (GDS)	65.6%	34.4%	100.0%	
	% within History of Sleep disturbance	53.8%	40.7%	48.5%	
	% of Total	31.8%	16.7%	48.5%	
Mild or Severe depression	Count	36	32	68	
	% within Level of depression (GDS)	52.9%	47.1%	100.0%	
	% within History of Sleep disturbance	46.2%	59.3%	51.5%	
	% of Total	27.3%	24.2%	51.5%	
Total	Count	78	54	132	
	% within Level of depression (GDS)	59.1%	40.9%	100.0%	
	% within History of Sleep disturbance	100.0%	100.0%	100.0%	
	% of Total	59.1%	40.9%	100.0%	

## Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.194 <sup>a</sup>	1	.139		
Continuity Correction <sup>b</sup>	1.701	1	.192		
Likelihood Ratio	2.203	1	.138		
Fisher's Exact Test				.159	.096
N of Valid Cases	132				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.18.

b. Computed only for a 2x2 table



**Table 6:**  
**Level of depression (GDS) \* Visitor frequency Crosstab**

			Visitor frequency				Total
			Never	Once every other month (10, 9 visits per year)	Once or twice a year ( like in holidays)	one visit or more per month (1, 2,3,4...etc visits per month)	
Level of Normal depression (GDS)	Count		9	15	17	23	64
	% within Level of depression (GDS)		14.1%	23.4%	26.6%	35.9%	100.0%
	% within Visitor frequency		40.9%	45.5%	53.1%	51.1%	48.5%
	% of Total		6.8%	11.4%	12.9%	17.4%	48.5%
Mild or Severe depression	Count		13	18	15	22	68
	% within Level of depression (GDS)		19.1%	26.5%	22.1%	32.4%	100.0%
	% within Visitor frequency		59.1%	54.5%	46.9%	48.9%	51.5%
	% of Total		9.8%	13.6%	11.4%	16.7%	51.5%
Total	Count		22	33	32	45	132
	% within Level of depression (GDS)		16.7%	25.0%	24.2%	34.1%	100.0%
	% within Visitor frequency		100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total		16.7%	25.0%	24.2%	34.1%	100.0%

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.027 <sup>a</sup>	3	.795
Likelihood Ratio	1.031	3	.794
N of Valid Cases	132		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.67.

**Table 7:**  
Level of depression (GDS) \* ADL

## Crosstab

			ADL			Total
			Dependent	Independent	Partially dependent	
Level of depression (GDS)	Normal	Count	18	17	29	64
		% within Level of depression (GDS)	28.1%	26.6%	45.3%	100.0%
		% within ADL	42.9%	53.1%	50.0%	48.5%
		% of Total	13.6%	12.9%	22.0%	48.5%
Mild or Severe depression		Count	24	15	29	68
		% within Level of depression (GDS)	35.3%	22.1%	42.6%	100.0%
		% within ADL	57.1%	46.9%	50.0%	51.5%
		% of Total	18.2%	11.4%	22.0%	51.5%
Total		Count	42	32	58	132
		% within Level of depression (GDS)	31.8%	24.2%	43.9%	100.0%
		% within ADL	100.0%	100.0%	100.0%	100.0%
		% of Total	31.8%	24.2%	43.9%	100.0%

## Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.862 <sup>a</sup>	2	.650
Likelihood Ratio	.864	2	.649
N of Valid Cases	132		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.52.

**Table 8:**  
**Level of depression (GDS) \* Intellectual impairment (MSE) Crosstab**

			Intellectual impairment (MSE)				Total
			Intact intellectual function	Mild intellectual function	Moderate intellectual function	Sever intellectual function	
Level of depression (GDS)	Normal	Count	31	17	10	6	64
		% within Level of depression (GDS)	48.4%	26.6%	15.6%	9.4%	100.0%
		% within Intellectual impairment(MSE)	55.4%	54.8%	31.3%	46.2%	48.5%
		% of Total	23.5%	12.9%	7.6%	4.5%	48.5%
Mild or Severe depression		Count	25	14	22	7	68
		% within Level of depression (GDS)	36.8%	20.6%	32.4%	10.3%	100.0%
		% within Intellectual impairment(MSE)	44.6%	45.2%	68.8%	53.8%	51.5%
		% of Total	18.9%	10.6%	16.7%	5.3%	51.5%
Total		Count	56	31	32	13	132
		% within Level of depression (GDS)	42.4%	23.5%	24.2%	9.8%	100.0%
		% within Intellectual impairment(MSE)	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	42.4%	23.5%	24.2%	9.8%	100.0%

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.394 <sup>a</sup>	3	.145
Likelihood Ratio	5.503	3	.138
N of Valid Cases	132		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.30.

**DISCUSSION:**

We found out that more than half of the elderly in nursing homes are suffering from mild to severe depression, which higher in compression to their peers of geriatric population living within the community<sup>(1, 8, 9,10, 11,12,13)</sup>. genders didn't contribute to the depression severity among the studied population unlike what was presented in Almanaa.h findings, further evaluation is needed<sup>(19)</sup>.

elder residents with multiple chronic comorbidities were more depressed (68.8%) than others with less chronic diseases, which possibly could be linked to less attentive medical care that they've been receiving<sup>(14,15)</sup>.

shorter length of stay is associated with higher depression prevalence (75%) which had been contributed to adapting to a new environment<sup>(15,20)</sup> and it's important to mention that elderly who had a history of depression were having flare ups later in life (65%). As a result, the home care institutions should have a thorough medical history of their residents and continuous psychiatric evaluation and support<sup>(26)</sup>.

Depression is the most common symptom of Minor Neurocognitive Disorder and dementia<sup>(23)</sup>, but we haven't find any correlation between cognitive function and depression, as well as between depression and LDL score, however the studies on risks factors of depression in nursing homes are insufficient, conflicting and need more investigations<sup>(8)</sup>.

**CONCLUSION:**

The high prevalence of depression among elderly in nursing homes is an alarming finding that need to be managed and more taking care of by the health care system in Saudi, specially that we lack a lot of studies and data on this subject.

**Limitations:**

A low response rate due to the medical conditions a lot of elderly had.

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