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Original Research Article

A cross-sectional study on behavioural and psychological symptoms of dementia in elderly and its impact on quality of life in a tertiary care hospital

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ABSTRACT

Background: Historically, the word dementia was derived from Latin word 'dementatus', which means 'out of one's mind'. There were 24.3 million people with dementia in the world and 4.6 million are being added every year. Present study was done to evaluate the behavioral and psychological symptoms of dementia in elderly patients and its impact on their quality of life.
Methods: It was a hospital based descriptive, cross-sectional study. 100 cognitively impaired patients in the age group of 60 years and above were enrolled. The socio-demographic profile, severity of dementia on MMSE; behavioral disturbances on BPSD; psychiatric illness on NPI; agitation on CMAI and their impact on quality of life, and disability were assessed on WHOQOL-Bref and WHO DAS 2.0 scales, respectively.
Results: Out of 110 patients that were screened, 100 participated in the study (response rate 91%). Majority of subjects (53%) were illiterate and belongs to rural background (57%). Mean dementia severity score was 17.01±4.439 SD which was of mild to moderate level. Overall mean age was 68.16±8.16 SD and negatively related (r= -0.652; F=27.044, p<0.001) but weakly associated to severity of dementia. There was a statistically significant increase in the NPI scores with increase in dementia severity (Item score F=91.754, p<0.001 and distress score F=81.647, p<0.001). There was significant increase in agitation/aggression (CMAI) with an increase in severity of dementia. BPSD on NPI item score was weakly related (r=0.757) and caused increase in disability but decrease in quality of life. Dementia severity as per MMSE score was negatively related to WHO DAS disability (r= -0.863), BPSD on NPI item (r= -0.797) and agitation/aggression on CMAI (r= -0.587). WHOQOL-Bref decreases with increase in severity of dementia and disability.
Conclusions: Dementia severity was of mild to moderate level and it increased with age. Most common psychiatric symptom was agitation/aggression (76%) and least common was hallucinations (12%). BPSD causes significant decrease in quality of life and an increase in severity of disability.

Keywords: Behavioral and psychiatric symptom dementia scale, Cohen-Mansfield agitation inventory, Mini mental state examination scale, Neuropsychiatric inventory, World Health Organization- quality of life scale, World Health Organization-disability scale

INTRODUCTION

Historically, the word dementia was derived from Latin word 'dementatus', which means 'out of one's mind'. There were 24.3 million people with dementia in the world and 4.6 million are being added every year. The prevalence of dementia in India and South Asia is 1.9% in those ≥60 years with an annual incidence of 4.3/1000. The prevalence is estimated to reach 3.6 million by the year 2020 and 7.5 million by 2040 in this region.[1]

The rate of increase was estimated to be 3-4 times higher in developing countries than in developed countries. The prevalence of moderate to severe dementia is approximately 5% in general population older than 65 years of age, and 20 to 40% in older than 85 years of age.[2,3]

However, the frequency of Alzheimer's disease (AD) in India varies from 0.34% to 1.5% for patients aged 60 years and above.[4] The estimated global cost for dementia is $818 billion and is expected to increase to $2 trillion by the year 2030.[5]

Behavioural and psychological symptoms of dementia (BPSD) is an integral part of dementia syndrome and associated with rapid rate of cognitive decline with greater impairment in activities of daily living (ADL). It refers to a disturbance in perception, thinking, mood and behavior of dementia patients and manifests as disinhibited behavior, delusions and hallucinations, verbal and physical aggression, agitation, anxiety and depression.

In BPSD apathy used to be the most common symptom ranged from 58% to 72%.[6,7] Other symptoms such as visual hallucinations 23-32%, auditory hallucination 9.2-16% and delusions of persecution are seen in 30–50% of dementia cases.[8,9] Family history of depression is the risk factor for developing major depressive episodes during the disease process, which ranged from 10 to 20% in AD.[10]

Pre-morbid neuroticism and low frustration tolerance are the psychological factors implicated in the origin of BPSD.[11] They cause greater impairment in ADL, rapid cognitive decline and are responsible for early institutionalization.[12] Moreover, increased number of BPSD correlates negatively with survival rates over a 3-year period.[13]

The high quality of life (QOL) indicates presence of positive effect, social network and family support, satisfactions (e.g. weight satisfaction and restful sleep), self-esteem and the absence of negative effect.[14,15] Whereas few studies reported decreased QOL in patients with severe psychiatric and behavioural problems.[16]

The progressive downward drift and degenerative course of dementia has deleterious effects on psycho-physiological health of the patient. Thus, the present study was taken to unravel the behavioural and psychological symptoms of elderly dementia and their impact on quality of life and disability.

The Present study was done to study the frequency distribution of dementia in elderly in tertiary care hospital, to assess the behavioral and psychological changes of dementia patients and to assess the perceived quality of life and disability in dementia patients.

METHODS

It was a hospital based descriptive cross-sectional study. 110 patients were screened, 10 patients dropped out at various stages of study.

Finally, 100 consecutive patients in the age group of 60 years and above with cognitive impairment that came to out-patient department of Psychiatry, Government Medical College, Patiala from June, 2016 to June, 2017 were enrolled. The informed written consent was taken and had an approval of institutional ethics committee.

The socio-demographic profile and information about the illness (source of referral, co-morbid physical conditions and psychiatric diagnosis) were recorded. Based on MMSE score, dementia was categorized into mild (score of 18 to 24), moderate (score of 10 to 17) and severe (score of 9 or less) types.

The neuropsychiatric symptoms and psychopathology of patients were assessed by using Neuropsychiatric Inventory (NPI) followed by Cohen-Mansfield Agitation Inventory (CMAI) to assess frequency of agitated behavior.

In order to understand their impact on quality of life, World Health Organization- Quality of Life (WHOQOL-Bref) and for disability World Health Organization-Disability (WHO DAS 2.0) scales were used, respectively.

Inclusion criteria

- Individuals attending the psychiatry OPD with age 60 years and above.
- Patients presenting with significant cognitive impairment.
- Participants accompanied by reliable informants.
- Those who gave voluntary informed consent.

Exclusion criteria

- Individuals with severe medical/surgical condition/disorder.
- Participants not accompanied by reliable informants.
- Those who refused to give written valid informed consent.

Instruments

Proforma for socio-demographic variables

A semi-structured proforma was used to obtain information about the participants and gather their socio-demographic details including age, gender, educational status, economic status, living conditions, family and personal history of any psychiatric illness.

Mini mental state examination (MMSE)

The 11-items screening instrument was used for assessment of an individual's orientation to time and place, recall ability, short-term memory, and arithmetic ability. It measures cognitive functioning in adults.

The internal consistency of scale reported to have alpha coefficient 0.68 to 0.96 and test-retest values 0.80.[17]

The neuropsychiatric inventory (NPI)

It is used to evaluate the neuropsychiatric symptoms and psychopathology of patients with Alzheimer's disease and other neurodegenerative disorders. It uses a structured, caregiver-based interview format to assess 10 behavioural domains (delusions, hallucinations, agitation, dysphoria, anxiety, apathy, irritability, euphoria, disinhibition, and aberrant motor behavior).

It produces four scores for frequency, severity, total, and distress/excess work caused by these symptoms. Maximum possible score in items domain is 144 (range 0-144) and maximum possible score in distress domain is 60 (range 0-60) and sensitive to capture treatment related behavioural changes and has good reliability.[18]

Cohen-Mansfield agitation inventory (CMAI)

Cohen-Mansfield Agitation Inventory (CMAI) is used to assess the frequency of manifestations of agitated behaviours in elderly persons. The CMAI is a caregivers' rating questionnaire consisting of 29 agitated behaviours, each rated on 7-point scale of frequency. Ratings pertain to the behavioural changes two weeks preceding the administration of the CMAI. The CMAI may be self-administered by a caregiver or it may be completed by interviewing a staff of family caregiver. The agitated behavior was divided into 4 factors subscales i.e. Aggressive Behavior, Physically Non-Aggressive Behavior, Verbally Agitated Behavior and Other behaviours as per the guidelines of CMAI manual.[19]

World Health Organization Quality of Life scale (WHOQOL-Bref)

It is a shorter 26-items version of the WHOQOL- 100 and focuses on an individuals' own views of their well-being, provides a new perspective on disease. The questionnaire contains two items from the Overall QOL and General Health and 24 items of satisfaction that divided into four domains: Physical health with 7 items (DOM1), psychological health with 6 items (DOM2), social relationships with 3 items (DOM3) and environmental health with 8 items (DOM4).

The item scores range from 1 to 5. Because the numbers of items are different for each domain, the domain scores are calculated by multiplying the average of the scores of all items in the domain by the same factor of 4. Thus, the domain scores would have the same range from 4 to 20. Transformation of domain scores to a 0 to 100-point scale was made by using the WHOQOL transformation table. The scale has good discriminant validity, sound content validity and good test-retest reliability.[20]

World Health Organization Disability Assessment Schedule 2.0 (WHO DAS 2.0)

It is reliable, applicable across cultures, and measures health and disability at population level or in clinical practice. It captures the level of functioning in six domains of life:

- Domain 1: Cognition – understanding and communicating
- Domain 2: Mobility – moving and getting around
- Domain 3: Self-care – attending to one's hygiene, dressing, eating and staying alone
- Domain 4: Getting along – interacting with other people
- Domain 5: Life activities – domestic responsibilities, leisure, work and school
- Domain 6: Participation – joining in community activities, participating in society.

Total score on WHODAS 2.0 i.e. General Disability Score (GDS) is in the range of 36-180.[21]

Statistical analysis

The observations were statistically analyzed by using software Statistica 7.0 and SPSS 20. Further, chi-squares compared socio-demographic variables with severity of dementia. ANOVA was applied wherever applicable.

Then, Pearson product-moment correlations were computed to study the relationships between age, dementia severity, NPI items score, NPI distress score, CMAI Total score, WHODAS 2.0 and WHOQOL score. P value ≤ 0.05 was considered as significant and P value ≤ 0.01 was considered as highly significant.

RESULTS

Out of a sample of N=100, 47% were females and 53% were males.

On age grouping 43% were less than 65 years of age and 57% were above 65 years of age. Most of them were illiterate (53%) and belong to rural background (67%). Distribution of other socio-demographic variables are shown in the (Table 1).

MMSE score distribution of dementia showed that majority belonged to mild dementia (52%) while moderate and severe dementia was seen in 38% and 10% respectively with overall mean score of 17.01 ± 4.439 SD which states mild to moderate level of dementia (Figure 1).

Table 1: Distribution of sample on socio-demographic variables.

Category	Variables	Frequency (n)	%
Gender	Female	47	47.0
	Male	53	53.0
	Total	100	100.0
Age (in years)	Less than 65	43	43.0
	65 or more	57	57.0
	Total	100	100.0
Education Status	Illiterate	53	53.0
	Primary	26	26.0
	Matriculation	9	9.0
	Higher sec	4	4.0
	Graduate	8	8.0
	Total	100	100.0
Background	Rural	67	67.0
	Urban	33	33.0
	Total	100	100.0
Family type	Joint	63	63.0
	Nuclear	37	37.0
	Total	100	100.0
Annual family Income (Rs.)	Above 30,000/-	81	81.0
	Below 30,000/-	19	19.0
	Total	100	100.0
Past history of Psychiatric illness	No	90	90.0
	Yes	10	10.0
	Total	100	100.0
Family history of psychiatric illness	No	87	87.0
	Yes	13	13.0
	Total	100	100.0

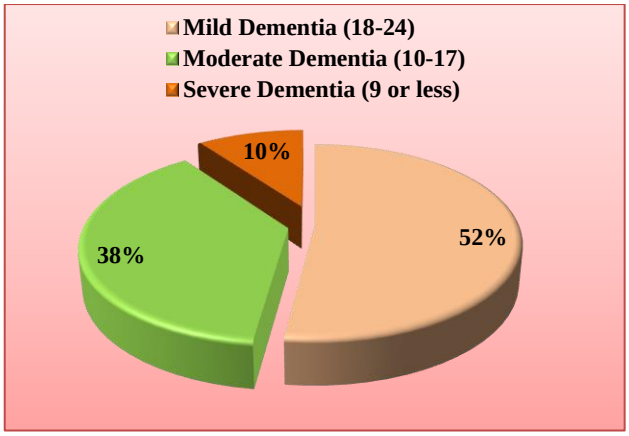

Figure 1: MMSE score distribution of dementia among N=100 subjects.

The mean age in years for mild dementia group was 64.17(±4.227 SD), moderate 70.61 (±8.429 SD) and severe 79.60 (±8.796 SD). Overall mean age was 68.16 (±8.165 SD) and the group comprised of late age onset dementia (LOD) having a highly significant association (F value=27.044, p=0.000) (Table 2).

Table 3 shows majority of our patients (81%) had family income above Rs. 30,000 per year. 6.2% of subjects with income above Rs. 30,000 had severe dementia while income below Rs. 30,000 had 26.3% of severe dementia and was statistically significant (χ^2=8.019**, p= 0.018).

Table 2: Distribution of age based on severity of dementia.

	Severity of dementia	N	Mean	Std. Deviation	Std. Error	95% Confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Age (in yrs) ≥60	Mild	52	64.17	4.227	0.586	63.00	65.35	60	80
	Moderate	38	70.61	8.429	1.367	67.83	73.38	60	88
	Severe	10	79.60	8.796	2.782	73.31	85.89	64	92
	Total	100	68.16	8.165	0.816	66.54	69.78	60	92
	Severity of dementia		Sum of squares		DF	Mean square	F	SIG. (ANOVA)	
	Between Groups		2362.519		2	1181.259			
	Within Groups		4236.921		97	43.680	27.044	0.000	
	Total		6599.440		99				

p<0.05* = significant; p<0.01** = highly significant

Table 3: Distribution of family income per year with severity of dementia.

	Dementia severity on MMSE			Total	Chi-Square (χ^2)	Asymp. Sig. (2-sided)
	Mild n (%)	Moderate n (%)	Severe n (%)			
Income						
Above 30,000	42 (51.9%)	34 (42.0%)	5 (6.2%)	81 (81%)		
Below 30,000	10 (52.6%)	4 (21.1%)	5 (26.3%)	19 (19%)	8.019**	0.018
Total	52 (52%)	38 (38%)	10 (10%)	100 (100%)		
Family H/o psychiatric illness						
No	47 (54%)	34 (39.1%)	6 (6.9%)	87 (100%)		
Yes	5 (38%)	4 (30.8%)	4 (30.8%)	13 (100%)	7.178**	0.028
Total	52 (52%)	38 (38%)	10 (10%)	100 (100%)		

p<0.05* = significant; p<0.01** = highly significant

Also, majority of the dementia patients (n=87) did not have any family history of psychiatric illness as compare to (n=13) having psychiatric illness.

However, 30.8% of patients of positive family history had severe dementia as compared to 6.9% without family history, which was statistically significant (χ^2=7.178**, p=0.028).

Table 4: Distribution of frequency and mean scores of individual items of Neuropsychiatric Inventory (NPI).

NPI item	Frequency	Mean item score±SD	Mean distress score±SD
Delusions	N=27	1.80±3.384	0.91±1.602
Hallucinations	N=12	0.72±2.202	0.38±1.099
Agitation/ aggression	N=76	5.95±4.637	2.59±1.928
Depression/ dysphoria	N=56	4.54±4.611	1.78±1.790
Anxiety	N=67	5.54±4.668	2.14±1.718
Elation/ euphoria	N=18	0.86±2.243	0.31 ±. 800
Apathy/ indifference	N=69	5.74±4.713	2.14±1.758
Disinhibition	N=15	0.75±2.012	0.75±1.794
Irritability/ lability	N=64	5.32±4.699	2.05±1.789
Aberrant motor behavior	N=52	3.82±4.232	1.56±1.702
Sleep and night time behavior disorders	N=67	4.48±4.160	1.93±1.689
Appetite/eating changes	N=53	3.10±3.521	1.35±1.431
Total Scores		42.62±16.58	17.85±7.98
F		91.754**	81.647**
P value (ANOVA)		0.000	0.000

p<0.05* = significant; p<0.01** = highly significant

Neuropsychiatric Inventory (NPI) individual item mean score and mean distress score showed that majority of subjects positive for agitation/aggression (76%), apathy/indifference (69%), sleep and night time behavioural disorder (67%), anxiety (67%) and irritability/lability (64%).

Somewhat less common were depression/dysphoria (56%), appetite/eating changes (53%), aberrant motor behavior (52%). Among least common were delusions (27%), elation/euphoria (18%), disinhibition (15%) and hallucinations (12%). Total NPI item score was 42.62 ±16.587 SD and total NPI distress score was 17.85 ±7.98 SD (Table 4).

There was a statistically significant increase in the NPI scores (Item score F=91.754, p<0.001 and distress score F=81.647, p<0.001) with increase in dementia severity (Figure 2).

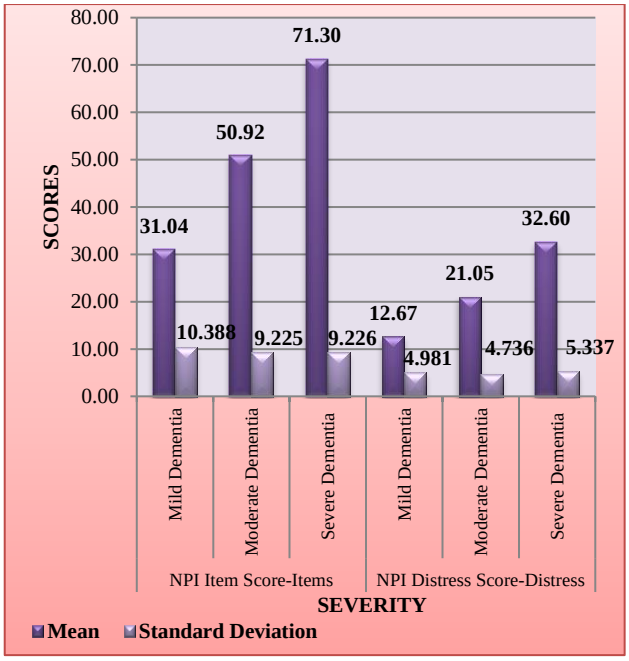

Figure 2: Distribution of NPI item score and distress score in relation to MMSE.

Using CMAI, agitated/aggressive behaviour of the sample was distributed into factors and subscale severity scores with their means.

The CMAI long form total score was 40.65±6.611 SD. Subscales of CMAI according to severity of dementia showed statistically significant increase in agitated/aggressive behaviour (F=18.992, p=<0.001) (Figure 3).

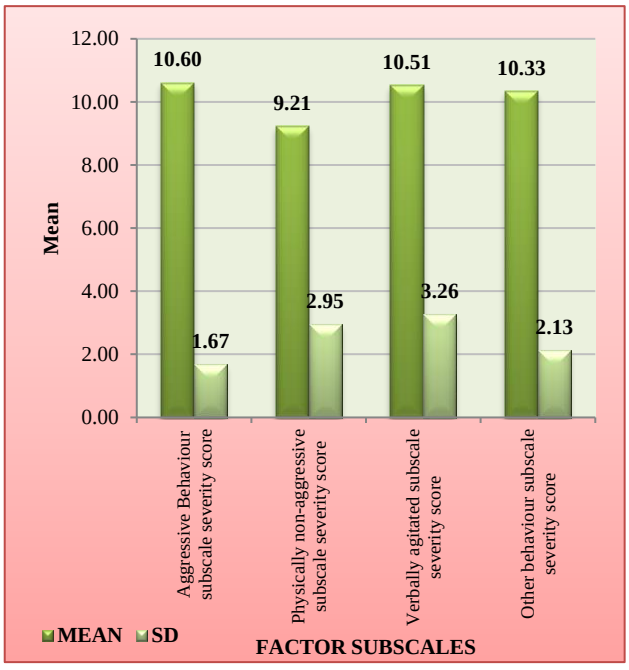

Figure 3: Distribution of Cohen Mansfield Agitation Inventory (CMAI) scores among factor subscales.

WHOQOL-Bref scores for quality of life among dementia patients and its relation with severity of dementia on MMSE showed statistically significant ($p<0.001$) decrease in all domains of quality of life (QOL) with increase in dementia severity (Table 5).

Table 5: Distribution of domain scores of WHOQOL-BREF with severity of dementia.

WHOQOL-BREF domains	Dementia severity on MMSE (n)	Mean	Std. Deviation	F	P Value (ANOVA)
Physical domain	Mild (52)	46.29	6.238	37.218**	0.000
	Moderate (38)	32.03	13.296		
	Severe (10)	21.80	11.989		
	Total (100)	38.42	13.240		
Psychological domain	Mild (52)	53.71	11.101	102.840**	0.000
	Moderate (38)	27.32	12.079		
	Severe (10)	9.40	4.719		
	Total (100)	39.25	19.353		
Social relationships domain	Mild (52)	38.12	8.983	46.588**	0.000
	Moderate (38)	25.95	5.502		
	Severe (10)	16.90	7.965		
	Total (100)	31.37	10.723		
Environment domain	Mild (52)	45.79	9.629	8.055**	0.001
	Moderate (38)	42.37	9.275		
	Severe (10)	33.10	7.355		
	Total (100)	43.22	9.946		

$p<0.05$* = significant; $p<0.01$** = highly significant

Table 6: Distribution of WHODAS 2.0 DOMAIN score and general disability score (GDS) with severity of dementia.

WHODAS 2.0 domains	Dementia severity on MMSE (n)	Mean	Std. Deviation	F	P Value (ANOVA)
Understanding and communicating	Mild (52)	15.50	4.395	71.713**	0.000
	Moderate (38)	22.76	3.097		
	Severe (10)	28.30	1.494		
	Total (100)	19.54	5.835		
Getting around	Mild (52)	10.33	2.861	35.362**	0.000
	Moderate (38)	15.16	4.571		
	Severe (10)	19.70	4.423		
	Total (100)	13.10	4.886		
Self care	Mild (52)	6.04	1.608	107.813**	0.000
	Moderate (38)	9.74	2.910		
	Severe (10)	16.50	1.080		
	Total (100)	8.49	3.852		
Getting along with people	Mild (52)	11.50	2.509	44.516**	0.000
	Moderate (38)	14.89	3.486		
	Severe (10)	20.50	2.718		
	Total (100)	13.69	4.027		
Life activities	Mild (52)	8.94	2.817	51.119**	0.000
	Moderate (38)	12.89	2.948		
	Severe (10)	17.70	1.767		
	Total (100)	11.32	3.957		
Participation in society	Mild (52)	15.31	3.938	48.834**	0.000
	Moderate (38)	22.13	4.680		
	Severe (10)	27.90	5.343		
	Total (100)	19.16	6.138		
General disability score (GDS)	Mild (52)	67.6154	13.48951	84.351**	0.000
	Moderate (38)	97.5789	19.17294		
	Severe (10)	130.6000	13.17574		
	Total (100)	85.3000	26.00641		

$p<0.05$* = significant; $p<0.01$** = highly significant

The distribution of disability on WHODAS 2.0 domain score and Global Disability Score (GDS) showed statistically significant increase (p<0.001) in disability for all domains of WHODAS 2.0 with an increase in severity of dementia (Table 6).

Table 7: Pearson product moment inter-correlation matrix among various parameters (N=100).

Variables	Age (in yrs)	MMSE score	NPI Item Score	NPI Distress Score	CMA-I	WHO DAS GDS	WHOQOL Q1	WHOQOL Q2	Physical domain	Psycho-logical domain	Social relation-ships domain	Environ-ment domain
Age (in yrs)	1	-0.652**	0.600**	0.648**	0.536**	0.843**	-0.613**	-0.585**	-0.817**	-0.551**	-0.523**	-0.170
MMSE score		1	-0.797**	-0.759**	-0.587**	-0.863**	0.803**	0.740**	0.703**	0.759**	0.752**	0.414**
NPI Item Score			1	0.948**	0.625**	0.757**	-0.733**	-0.686**	-0.680**	-0.815**	-0.634**	-0.293**
NPI Distress Score				1	0.644**	0.778**	-0.681**	-0.643**	-0.688**	-0.808**	-0.569**	-0.243*
CMA-I					1	0.667**	-0.526**	-0.454**	-0.593**	-0.499**	-0.530**	-0.123
WHO DAS GDS						1	-0.782**	-0.732**	-0.783**	-0.743**	-0.638**	-0.315**
WHOQOL Q1							1	0.909**	0.692**	0.813**	0.782**	0.566**
WHOQOL Q2								1	0.680**	0.750**	0.697**	0.479**
Physical domain									1	0.611**	0.676**	0.141
Psychological domain										1	0.645**	0.317**
Social relationships domain											1	0.425**
Environment domain												1

p<0.05* = significant; p<0.01** = highly significant

Table 7 shows inter-correlation matrix between age, MMSE, NPI (Item score and Distress score), CMAI, WHODAS 2.0 and WHOQOL-Bref. Age had a significant negative relationship with MMSE score and in all domains WHOQOL-Bref except environment domain where the relationship was non-significant. There was a positive significant relationship between age and NPI, age and CMAI, age and WHODAS scores. It was found that MMSE score had significant negative correlation with NPI scores (both Item score and Distress score), CMAI score and WHODAS 2.0 score but had positive significant relationship with all domains of WHOQOL-Bref. NPI items score and NPI distress score had positive significant correlation between them. NPI (items score and distress score) had a significant positive relationship with CMAI score and WHODAS GDS scores while a significant negative relationship with WHOQOL-Bref score (all domains). CMAI score had a negative significant relationship with all domains of WHOQOL-Bref except environment domain. There was significant negative correlation between WHODAS and all domains of WHOQOL-Bref. All domains of WHOQOL-Bref were positively inter-correlated except physical and environment domain where relationship was insignificant.

DISCUSSION

In present study, the overall mean age was 68.16 years (±8.165 SD) and mean age for mild dementia was 64.17 (±4.227 SD), moderate 70.61 (±8.429 SD) and severe type 79.60 (±8.796 SD). Dementia ranged from mild to moderate in severity. Age was negatively related (r= -0.652) with MMSE and WHOQOL Bref scores (all domain) but weakly associated, which means that as the age increases severity of dementia also increases but the quality of life declines as reported in various studies.[22]

Male and female subjects were almost equal in number i.e., 53 and 47 respectively. On comparison of gender and education with severity of dementia, non-significant association was seen. However, Lipnicki et al and another study by Sharp et al reported that every additional year of an education, slows the rate of cognitive decline whereas others reported non-uniformity of education in attenuating the risk of dementia.[23,24] Although Teri et al reported overall increase of severity with cognitive impairment, but behavioural problems were not significantly associated with patient's age, gender, duration or age at onset of dementia.[25]

Most of subjects were from rural population (67%), living in a joint family (63%) and had an income of above 30,000 per year (81%). Statistically non-significant association was observed between family type (nuclear or joint) and dementia severity but had association among family income group. Similarly, non-significant association was found between rural and urban population with severity of dementia and findings were consistent with Lorenzo-López et al.[26]

Majority of the patients i.e., 90% did not have any history of psychiatric illness and 54% did not show any family history of psychiatric illness but was significantly associated with dementia severity (χ^2=7.178**, p=0.028). Almeida et al reported no association between past depression and incidental cognitive impairment.[27]

In the present study, almost all subjects had at least one neuropsychiatric symptom on NPI and mean NPI-item score and mean NPI-distress score increases with an increase in severity of dementia, which was strongly related (r=0.948) and associated. Benoit et al reported BPSD in 92.5% of patients with MMSE score between 11 and 20, and in 84% of patients with a MMSE score between 21 and 30.[28] Kazui et al also reported increase in mean NPI scores with an increase in severity of dementia.[29]

The findings of BPSD on NPI item score were positively related with distress (NPI distress score), agitation (CMAI score) and disability (WHODAS 2.0). Storti et al recorded a strong and significant correlation between the total NPI-item and NPI-distress scores.[30] While NPI scores in present study had negative correlation with all domains of WHOQOL Bref indicating that higher BPSD were associated with poor quality of life, as also shown by Ryu et al where neuropsychiatric symptoms were associated with attenuated quality of life.[31]

Agitation/aggressive behavior were the most common symptom 76% in present study. Mean scores of the patients on CMAI increase as the severity of dementia increases and had negative but significant relationship with QOL except environment domain where it was non-significant. Similar findings were reported by Livingston et al where average CMAI score in mild dementia was 37.0, SD=10.4 and it increases with an increase in severity of dementia (mild = 43.5, SD±15.6; moderate = 48.7, SD ±19.0; severe = 48.3, SD±19.7).[32] The results were comparable to Jost and Grossberg who evaluated 100 autopsy-confirmed AD cases and reported irritability, agitation and aggression in 81% of patients.[33] Mega et al reported anxiety, dysphoria and apathy in dementia patients 24%, 25% and 48% to 92% while the same was 67%, 56% and 69% respectively in the present study.[34]

CMAI scores in present study were positively correlated with age, neuropsychiatric behavior (NPI scores) and disability (WHODAS 2.0 scores) but were negatively related with MMSE scores (lower the score, higher the dementia) and all other domains of WHOQOL Bref except environment domain, which did not show significant relationship (p= 0.222). This shows that Agitation/aggression symptoms increase with age and in the presence of other BPSD they are related to increase disability. Similar findings were reported by various studies that revealed behavioural disturbances, especially agitation, appeared to be negatively related to quality of life, activities of daily living and cognition.[35,36]

Many studies delineated cognitive deficits to be significantly associated with worsening of disability in the elderly population. Present study revealed that severity of dementia increases significantly with an increase in severity of BPSD but decreases QOL. This increase in severity of BPSD caused decrease of QOL and plausibly attributed to various factors e.g., agitation/aggression, depression and apathy.[37,38]

WHODAS 2.0 showed that mean disability score increases with increase in severity of dementia and statistically significant association was observed in all domains. Results were in concordance with studies where cognitive deficit was significantly associated with disability in elderly population; global activity limitation and participation restriction.[39,40]

Thus, findings of correlations matrix showed age of dementia subjects had positive correlation with BPSD i.e., higher NPI, CMAI scores and WHODAS 2.0 disability scores. Furthermore, dementia severity as delineated by MMSE scores (lower the score, severe the dementia) showed a negative correlation with BPSD on NPI, agitation on CMAI and disability on WHODAS 2.0 i.e., decrease in MMSE score has increase in BPSD, agitation and disability.

The small sample size was due to time limited nature of study and needs a larger sample size to accurately assess BPSD and QOL. The study lacks follow-up analysis of the patients and does not include control group for comparison between dementia patients and general population where possibility of missing milder form of dementia (mild cognitive impairment) cases with minor or absent BPSD cannot be ruled out.

CONCLUSION

Dementia was of mild to moderate in severity. Age, family income and family history of psychiatric illness were the significant risk factors while personal history of psychiatric illness had no relationship with severity of dementia. BPSD, CMAI were positively related to severity of dementia, which lead to decreased QOL and an increase in disability.

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