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RESEARCH ARTICLE

Impact of COVID on the mental health and cognitive functioning level of elderly individuals

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ABSTRACT

Background: The unprecedented COVID-19 outbreak caused widespread worry and alarm throughout the world. The virus affected people of all ages, although the elderly is at a larger risk. There was greater effect of covid in terms of mental health and cognitive functions in older people due to physiological changes especially brain tissue damage and neurochemical imbalance. This study examines the mental health problems and the cognitive functioning that older people encounter as a result COVID affected.

Objectives: To study the mental health and cognitive functioning level in older adults with covid affect in comparison with non-covid affect.

Methods: Comparative study design was adapted; participants are drawn on purposive of study requirement include those who are aged above 60 years with covid affected and non-covid affected. Socio-demographic details were collected. Clinical scales such as GHQ, GDS and HARS were utilized for checking the mental health condition of the elderly individuals. MMSE scale was used for assessing the cognitive level.

Results: The sample size consisted of 30 elderly individuals with 15 covid affect and 15 elderly with non-covid affected. The mean age of the covid affected group was 65.9 years and non-covid group was 65.8. Covid group scored low on orientation mean and SD (2.75±1.91), memory (1.75±1.40) and total MMSE (18.45±5.10) than compared non-covid affected. There is a significant difference between the covid and non-covid on orientation p=0.023* and total MMSE p=0.007**

Discussion: The results revealed that covid affected group scored lower on orientation, memory and total cognitive score than non-covid affected elderly individuals. Age and education has positive association with cognition level and general health had negative correlation with orientation indicates higher scores on GHQ lower in orientation. Screening mental health and cognitive functioning will help in providing treatment at the earlier and protects from worsening the condition.

Keywords: Elderly individuals; covid; mental health; cognition

Introduction

The globe has been confronted with the problem of corona virus disease-19 (COVID-19), a serious infectious disease caused by the corona virus, SARS-CoV-2, since December 2019[1]. This pandemic affected all the age groups however while considering the older age group the impact was seen more significantly [2,3].

Ageing is a natural process with multilevel of changes. According to United Nations population forecasts, the number of persons aged 65 and over, which stood at 703 million in 2019, would more than quadruple to 1.5 billion by 2050, accounting for 16% of the global population[4]. Emerging countries such as India are ageing at a quicker rate.[3] The proportion of elderly in the overall population is predicted to rise from roughly 7.5 percent in 2001 to nearly 12.5 percent by 2026, and reach 19.5 percent by 2050[5].

Due to protection and safe guard of elderly individuals in spreading of infection the protective measures such as Isolation and limited social activities have negatively impact on the physical health and mental health of elderly[6,3]. COVID-19, on the other hand, considered to be predisposing to or worsen mental illnesses by resulting in systemic hyper inflammation. It has the potential to disrupt the blood-brain barrier, leading in central nervous system inflammation[7].

Elderly individuals are sensitive and vulnerable in the developing stress in the face of COVID-19 pandemic, focusing on the stress's hormonal and inflammatory pathways[8]. SARS-CoV-2 hyper inflammation is a risk factor for geriatric mental problems such as depression, anxiety, panic attacks and others[9,10]. The findings from survey showed 16.5% of participants had moderate to severe depression, 28.8% had anxiety issues and 8.1% with stress[6]. It is also identified that all these mental health problems in elderly during quarantine was due the fear of getting infected and resilience played mediating factor[6].

There are research evidences that elderly individuals affected with COVID developed mental health problems and also showed effect in subjective cognitive functions[6]. There is also evidence of that elderly with medical co-morbidities such as hypertension, diabetes, are at high risk in developing cognitive impairments[9,7].The elderly with chronic illnesses have the most severe symptoms and the rate of mortality. Chronic diseases with a high level of chronic inflammation may be predisposed to a more severe progression of COVID-19[3]. Elderly individuals are of high risk of developing severe COVID-19 due to age and medical co-morbid factors and, they are more vulnerable to developing neuropsychiatric and cognitive impairments[11,12].

The research suggests that various care and attention measures, as well as entertainment and activities that might lessen the damage to mental and physical health and improve the elderly quality of life[9,13]. It is also suggestive of intervention for treating the elderly for mental health problems through community level of programs, social activities by utilizing digital technologies which can improve the quality of life, and management of adverse symptoms of COVID[10,14]. Hence the present study aims at studying the mental health problems, medical complications and cognitive functioning level in COVID affected elderly individuals. To understand the state of mental health and cognitive level guides in the treating the elderly population.

Methodology

The study was conducted as a part of Master of Science dissertation in psychology which examined mental health and cognitive functioning level in covid affected older individuals. Subjects were selected and recruited through purposive sampling method according to the study criteria. The control group consisted of older adults without covid affected. Participants were recruited from the volunteers from senior citizen forums, associations and old age homes. Ethical clearance was obtained from institutional review board. Written Informed consent was taken from all the participants for the study. The covid affected group diagnosis in each case was made after a thorough evaluation of medical reports confirmed by the medical practitioner for the covid affected group. Mini Mental Status Examination score less than 24 were excluded from the study. Participants with severe medical illnesses, visual and hearing impairment were excluded from the study. Both the groups were assessed with General Health Questionnaire-12(GHQ-12)[15],Geriatric Depression Scale-short form (GDS-15 items)[16], Hamilton Anxiety Rating Scale (HARS)[17] and Mini Mental Status Examination (MMSE)[18]

PARTICIPANTS:

Participants consisted of 30 elderly individuals with 15 covid affected and 15 non-covid affected elderly individuals. All participants were aged above 65 years, recruited those who meet the study criteria.

PROCEDURE:

15 covid affected and 15non-covid affected was recruited through purposive sampling. The ethical considerations such as informed consent and confidentiality were maintained. Socio-demographic details were collected. Clinical scales such as GHQ, GDS and HARS were utilized for checking the mental health condition of the elderly individuals. MMSE scale was used for assessing the cognitive level. After all the data was collected, each subject's scores were calculated manually following the scoring norm of the tool. Then the data was entered in the SPSS to run the analysis.

ANALYSIS OF DATA

The data was analyzed quantitatively using SPSS 26. Descriptive statistics like mean and SD were utilized to describe the continuous variables and frequency and percentage were used to describe categorical variables. Normality of the data was tested using normal frequency distribution curve. Independent Sample t-test was computed to assess the statistical difference between the groups for clinical scales and cognitive function. Pearson's correlation was computed to assess the relationship between Socio-demographic variables such as age and education, clinical scales and the cognitive function.

FINDINGS

Table 1: *Socio-demographic details of study samples*

Characteristics	**COVID AFFECTED n=15**	**NON-COVID AFFECTED n=15**
	Mean (SD) /Frequency (%)	**Mean (SD) /Frequency (%)**
Age in years * *Mean±SD*	69.93±7.98	65.80±6.29
Sex		
Male	12 (80%)	8 (53.3%)
Female	3 (20%)	7 (46.7%)
Education in years* *Mean±SD*	13.67±3.01	16.33±2.82
Socio-economic status-		
Lower SES	8 (53.3%)	10 (66.7%)
Middle and High SES	7 (46.7%)	5 (33.3%)
Type of family -		
Nuclear family	7 (46.7%)	14 (93.3%)
Joint family	8 (53.3%)	1 (6.7%)

**Mean and SD*

Table 1 shows the descriptive statistics of the study sample. The study sample included 15 covid affected and 15 non-covid affected elderly individuals. The covid affected mean and SD (mean age=69.93±7.98) consisted of 12 male and 3 female and non-covid affected elderly (mean age= 65.80±6.29) consisted of 8 males and 7 females. The mean and SD education of covid affected and non-covid affected were 13.67±3.01 and 16.33±2.82 respectively. In non-covid affected, 67% of them are from lower SES and also 93% they are from nuclear family background.

Table 2. *Clinical scales and cognitive scores of both the group*

Variables	**COVID AFFECTED**	**NON-COVID AFFECTED**	**t-value**	**p-value**
	Mean (SD)	**Mean (SD)**		
GHQ-12	14.88±8.82	12.86±9.00	0.614	0.544
GDS	3.26 ± 0.73	2.66 ± 0.97	1.931	0.064
HARS	2.73±0.59	2.26±0.70	1.963	0.060
MMSE-Orientation	2.75±1.91	3.70±1.40	-2.385	0.023*
MMSE-Memory	1.75±1.40	2.10±0.99	-.700	0.490
MMSE-Visuospatial	0.60±0.50	0.30±0.40	-.360	0.726
MMSE-Total	18.45±5.10	19.50±3.80	2.892	0.007**

t- independent sample test

In clinical scale assessment, the mean score of GHQ-12 for COVID affected was 14.88(SD-8.82) and NON-COVID was 12.86 (SD-9.00). In GDS, the mean score of the COVID affected and NON-COVID was 3.26 (SD 0.73) and 2.66 (SD-0.97) and HARS mean and SD score was 2.73 (0.59) and 2.26 (0.70) respectively. There was no significant difference between the groups on all 3 scales. Cognitive scale MMSE mean and SD by COVID and NON-COVID on orientation was 2.75±1.91 and 3.70±1.40, on memory was 1.75±1.40 2.10±0.99 and Visuo-spatial was 0.60±0.50 0.30±0.40 respectively. There was significant difference between the groups on orientation. Similarly, there was significant difference between the groups on total MMSE score 19.45±5.10 and 18.50±3.80 (p-value 0.007*) shown in Table 2.

Table 3. *Association of clinical scales, age and education with cognitive score in both the groups*

GROUP	Cognitive domains	GHQ	GDS	HARS	Age	Education
	MMSE	Correlation Coefficient				
COVID AFFECTED	MMSE-Orientation	-.551*	0.109	-0.182	0.18	-0.085
	MMSE-Memory	-0.374	0.008	-0.339	-0.344	0.065
	MMSE-Visuo-spatial	-0.371	0.254	0	0.016	0.378
	Total-MMSE	0.086	0.442	0.234	-0.069	-0.448
NON-COVID AFFECTED	MMSE-Orientation	-0.064	0.239	0.092	0.02	0.26
	MMSE-Memory	0.009	0.493	.638*	-0.16	-0.011
	MMSE-Visuo-spatial	-0.217	0.215	0.034	0.421	0.135
	Total-MMSE	-0.276	0.271	0.06	.546*	-0.078

Table 3. Correlational analysis of clinical scales, age and education on cognitive domains showed negative correlational with GHQ (r=-.551) and orientation indicates that higher the score on GHQ lower the performance on orientation. However, there was no other association between the other scale and cognitive domains. In NON-Covid group, there was positive correlational between HARS (r=.638) and memory as well with age (r.546) and total cognitive score. This indicates that higher score on anxiety influence the memory performance also younger the age better performance on cognition.

Discussion

Mental health and Cognitive impairment in older individuals is serious concern apart from medical morbidity, impaired functioning and increased risk of infectious disease. The research explored the mental health and cognitive functioning level of the elderly individuals with covid affected, which also studied the relationship between the socio-demographic variables with cognitive performance level.

According to the descriptive statistics, elderly covid affected had 12 males and 3 females; mean age of 69.9 years and non-covid elderly individuals 8 males and 7 females; mean age of 65.5 years. The study findings on clinical scales GHQ, GDS and HARS showed higher scores by covid affected elderly than compared with non-affected. However, there was no significant differences between the both the groups on all the 3 scales. The covid affected elderly were undergoing some minimal level of mental health issues like depression when they were in isolation and also certain amount of anxiety level. These findings are partially accepting the study hypothesis stating that 'Elderly people with covid will have high risk for anxiety and depression'. Studies have shown similar findings that elderly individuals affected with COVID have depression, anxiety, stress, panic attacks due the fear of spreading of viral infection[10,2,19]. On the contrary, the CDC report states that younger adults are experienced more anxiety, depression, and posttraumatic stress than older adults. However the mental health issues were in presence of different living status and setting in older people[2].

Analysis of cognitive functioning on MMSE findings revealed that covid affect shown poorer score on orientation, and total score in compared with non-covid group. These findings suggestive of effect of covid and also indicating influence of aging process which will affect the cognitive functioning level. These finding accepts the study second hypothesis stating that 'Elderly people with covid will have poor cognitive functioning'. This finding was support by the studies on cognitive functions in elderly in COVID affected, mental health problems, elderly individuals with MCI and dementia[20,21] There was relation between the general health issues with the orientation score and anxiety level and overall cognition level.[22,23] This indicated that health issues and anxiety level influence the cognitive functioning. This is similar to the study findings by Suttan et al., and Amieva et al., that worries about health, reduced physical activities and lack of social interaction during pandemic influenced the cognitive functions [24,2526]. The loneliness during the pandemic lead to serious mental health problems in the older individuals[27,22]. There is association

between the age and education level with cognitive functioning level suggests that younger the age better performance on cognition.

Ageing is a gradually process that affected the psychological well-being and in turn affect the cognitive level. With the effect of covid and aging physiological changes in the elderly individuals has adversely affected mental health and their cognitive functions [28,20,29]. The correlational analysis also suggests that education will be protective factor for maintaining the cognitive functioning level. This is suggestive of higher education have better cognitive functioning. Aging process is a multiple physical and physiological changes occur which will adversely affect the elderly individuals mental health and cognitive aspects[3031]. In covid affected older individuals A study by Klaiber et al., found that older individuals perceived coping efficacy which benefited on emotional well-being and less reactive in facing the covid daily stressors since they had minimal primary stressors during the pandemic[31]. However, positive events did not show any effect in older adults than compare to younger adults.

The association of mental health and cognitive functions suggests that covid affected group had affected with general health and orientation. Whereas in non-covid affected group, anxiety and aging influence the memory and overall cognitive domains. This indicates that anxiety and aging influence the cognitive functioning of older individual despite of non-covid affected group[32,28,33]. The potential risk factors in older individual could be the psychological and biological factors due aging process while in this pandemic even worsen the condition of the individuals [29,34]. Screening and identification of the contributing factors and coping strategies for mental health problems and cognitive functions will benefit the older people in taking treatment at initial stage and better improvement[32].

To summarise, our present study found mild deficits in orientation cognitive domain and overall MMSE in covid affected older adults in compared to non-covid affected older adults. However, there was relatively well preserved in verbal memory and visuo-spatial memory in both the groups. While there was positive association between anxiety level and aging with memory and overall cognitive domain in non-covid affected group suggesting that anxiety and aging will affect the cognitive functioning of older adults.

The strengths of our study include period of the study conducted, during the pandemic to understand the impact covid affected in older individuals in compared with non-affected group. The use of age appropriate validated tool for screening the mental health and cognitive function in older adults.

Limitations

The study participants are not matched with gender, education level which limited in exploring the gender influence and education. Since the sample was small statistical significant difference were not found in the screening scale and cognitive functions through mini mental status examination. Suggestive of taking large sample to identify the mental problems and cognitive functions with gender, education and socio-demographics details such as occupational level and living status.

Implications

The study highlights the need for routine screening for mental health issues and cognitive in older individuals with COVID affected. There is also need to screen for neurological co-morbidities and genetic factors for cognitive deficits in elderly affected with COVID. Future studies with screening for all these will help in early detection and reduced the treatment gap.

Conclusion

Elderly individuals with covid-affected showed slightly higher scores on clinical scales such as general health questionnaire, geriatric depression scale and Hamilton anxiety rating scale than compared with non-covid affected elderly individuals. Similarly, the findings on cognitive testing showed that covid affected performed poorer on cognitive domains such as orientation, memory and overall cognitive functions in compared with non-covid affected. The correlation also suggests that general health and the anxiety level are associated with cognitive functions indicating higher score on health issues and anxiety affected the cognitive level of the elderly individuals. Education and occupational level plays as a protective factors for maintaining better cognitive functioning level.

Conflicts of Interest Statement: No

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