Epidemiology of Geriatric Syndromes among Older People Residing in Six Old-Age Homes of Delhi-NCR

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Abstract

Introduction: The frequency of geriatric syndromes (GSs) such as cognitive impairment (CI), depression, and malnutrition among older people residing in old-age homes (OAHs) of Delhi-National Capital Territory Region (NCR) has not been reported. The availability of such data determines the quality of health care. The present study aims to assess the frequency of GS among residents of six OAHs in Delhi-NCR. **Materials and Methods:** The study was carried out after obtaining informed written consent from all participants. The team comprising doctors, physiotherapists, and nurses visited the OAHs and assessed GSs using a psychometrically validated screening tool ICT-BRIEF 30. Other standard tools such as Snellen's chart, whisper voice test, mini nutritional assessment, time up and go test score, Mini-Cog, and geriatric depression scale 5 were used to assess vision, hearing, nutrition, mobility, cognition, and mood, respectively. **Results:** Out of 131 participants, low vision was observed in 69.47%, hearing impairment in 20.61%, malnutrition in 12.9%, risk of fall in 18.32%, CI in 46.56%, and depression in 62.59% of the participants. Hearing impairment was found to be significantly associated with quality of life and cognition. **Conclusion:** The present study from Delhi showed high frequency of vision impairment, CI, frailty, depression, and malnutrition in older people residing in OAHs. 20% of the participants had functional loss due to various reasons. Hence, the owner/caretaker of OAHs of Delhi/NCR needs to be proactive in screening the residents for various GSs to provide quality care to the residents.

Keywords: *Geriatric syndromes, old-age home, quality of life*

Introduction

India is witnessing a monumental growth of older people, which has a major social, economic, and health impact on the country.[1] This demographic shift along with rapid urbanization and westernization has also brought about drastic changes in the familial and cultural aspects. The disintegration of the joint family system, loss of spouse, empty nest syndrome, misbehavior of the children, financial insecurity, and lack of emotional support often compel older people to resettle in long-term care centers (old age homes [OAHs]).[2] Age-associated physical and cognitive decline could also expedite the shift. The scenario of older people belonging to the lower economic status may be different[3] where the only earning member of the family would often find it difficult to take care of the basic needs of the young generation (education, healthcare, and other needs), leave aside the need of older family members.

Although the concept of OAH in India has been adopted from the institutional/long-term care centers of the western world, its purpose often gets diluted in most of the nongovernment organization (NGO)-run OAHs.[4] These centers sometimes lack provisions of holistic health-care facilities to its residents. A statutory regulatory body to monitor the functioning of OAHs is yet to be in existence and is often poorly managed.[4] However, a healthy and active late life is the fundamental right of every individual, including for those who are staying in OAHs.

Older people suffers from multiple age related complex health issues, termed as geriatric syndromes (GS), which has substantial impact on their functionality and quality of life.[5] Although the prevalence of GS is increasingly reported among older people in various settings, and early detection of GS plays a major role in preventing functional loss,[6] there is a paucity of data on the occurrence of GS in

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OAHs situated in Delhi-National Capital Territory Region (NCR).

As per the preliminary survey by Healthy Aging India (HAI), a Delhi-based nonprofit organization, there is no active mechanism to screen the unmet health needs, GS, and functional decline of OAH residents at the doorstep by geriatrically sensitized team of doctors.

HAI with technical support from the Department of Geriatric Medicine and financial support from Rotary Club International is running a Comprehensive Mobile Health Care Van (CMHCV) to provide 360° care to 1777 older adults residing in 27 OAHs of Delhi-NCR since December 2018. CMHCV team comprised a geriatrically sensitized doctor, a qualified and experienced physiotherapist, a nurse, and a laboratory technician. The doctor holds Bachelor of Ayurvedic Medicine and Surgery (AYUSH) degree and has 10 years of clinical experience as general practitioner. The team visits OAHs on a monthly basis. The residents were provided with medicines and rehabilitation services free of cost and referred to the Department of Geriatric Medicine for necessary intervention, wherever indicated.

The present study aims to assess the prevalence of GS, which affects the intrinsic capacity such as vision, hearing impairment, nutrition, fall and mobility, cognitive impairment (CI), depression, and urinary incontinence (UI), constipation, and frailty.

Materials and Methods

Study design

This cross-sectional study was carried out in six OAHs of Delhi and the NCR.The study was approved by the Institute Ethics Committee (322/5/2018) of the All India Institute of Medical Sciences, New Delhi, before its commencement. The participants were recruited after obtaining their informed written consent.

Sampling

The number of residents was different in each OAH. They were heterogeneous with respect to their age, gender and physical and mental capabilities. The study included the consenting participants aged 60 years and above. Residents who were aged <60 years and individuals with severe mental or physical disabilities by birth were excluded from the study.

Out of the 48 NGO-run OAHs in Delhi-NCR,[7] 27 were selected and served by HAI based on the following criteria

1. The organization which gave consent
2. OAH where more than 30% of the residents were not able to bear their healthcare-related expenses
3. The OAH residents who neither had medical coverage in the form of health insurance nor a beneficiary of government schemes.

Training of comprehensive mobile health-care van team

Training of the staff was conducted by the specialists in geriatric medicine quarterly for 15 hours (divided into five sessions) at HAI office, J-103, Gautam Nagar, New Delhi. The team was sensitized about various health-related issues of older people and its management.

Visit schedule, assessment tool, and data collection

Detailed clinical assessment was performed by a nurse sensitized in geriatric care with 5 years of experience. Parameters such as blood pressure and blood sugar were also tested using standard methods. The participants were initially screened by a psychometrically validated screening tool, ICT BRIEF-30,[8] which consists of 30 questions, including the questions on various determinants of healthy aging. Factor analysis was performed to elucidate the construct validity of the ICT-BRIEF-30 during its development.[8] The details collected by ICT-BRIEF 30 were difficulty in passing urine, UI, constipation, polypharmacy, hospitalization, trouble in sleeping, financial management, elder abuse, health perception, and life satisfaction. Questionnaire-based screening was carried out by HAI staff with medical social workers.

GSs of OAH residents were assessed using:

a. Snellen's chart for vision:[9] This chart consists of 11 lines, where each line contains letters of varying sizes (one large letter E on the top and smaller letters on subsequent lines). A person taking the test is asked to stand 20 ft away from the chart and read the letters covering one eye at a time. Jaeger chart was used to assess near vision[10]
b. Whispered voice test for hearing impairment:[11] The investigator stood outside the patient's field of vision at 33 cm from each ear and then whispered at each side a simple brief question such as "What is your name?" In case the older person does not respond, the external auditory canal was inspected for any obstruction that might lead to poor auditory acuity. In the absence of obstruction, the person was referred to a specialized health-care center for advanced audiometric testing
c. Mini nutritional assessment (MNA) for nutrition:[12] Detailed assessment of food intake, weight loss during the past months, mobility, psychological stress, acute disease condition, body mass index, calf circumference, and neuropsychological problems were assessed by MNA. The MNA identifies older people at nutritional risk before weight loss occurs. The nutritional status of the participants was assessed by MNA (MNA®, Nestle Nutrition Institute), an 18-point questionnaire. Participants scoring <17, 17–23.5, and 24–30 were labeled as "malnourished," "at risk of malnutrition," and with "normal nutritional status," respectively.

Mobility

d. Time up and go test (TUG) for mobility:[13] Functional status was assessed by a physiotherapist using the TUG test (Physiopedia, 2018). It is one of the quickest and best tools to assess the functionality and lower limb muscle strength of older people and to predict long-term morbidity. For the TUG test, participants were instructed to rise from an armless chair, walk for 3 m in their usual manner and at a normal pace, turn around, walk back, and sit on the chair again. Participants performed the test with or without footwear or gait aids. The time it took for the participants to perform the tasks was noted using a stopwatch. The timing was started as the word "go" was uttered and stopped when the participant was again seated correctly, reclined in a chair.

Cognition

e. Mini-Cog:[14] Cognition/memory was assessed using Mini-Cog, which consisted of two components, a 3-item recall test for memory and a scored clock drawing test.

Mood

f. Geriatric depression scale (GDS)-5:[15] Depression was assessed by GDS-5. Study participants answered five questions: (1) Are you satisfied with your life? (2) Do you often get bored? (3) Do you often feel helpless? (4) Do you prefer to stay at home rather than going out and doing new things? and (5) Do you feel pretty worthless the way you are now? Positive answers for depression screening are yes to questions 2, 3, 4, and 5 and no to question 1. Score >2 requires further assessment.

Assessment of frailty

Frailty was assessed using the TUG score. To identify the frail population, a relatively high cutoff (TUG >16 s) was considered, as per the previous literature.[16]

Statistical analysis

This descriptive study used Stata Version 14 (Stata Corp. 2015. Stata Statistical Software: Release 14. College Station, TX: Stata Corp LP) for the analysis. Qualitative variables of the participant characteristics were reported as numbers or percentages, while quantitative data were reported as the mean ± standard deviation (SD). Chi-square/Fisher's exact test was carried out to establish an association between the variables and *t*-test was applied to observe the difference in the quality of life, and frailty status. A $P < 0.05$ was considered statistically significant.

Results

Sociodemographic profile

Out of 131 older people residing in OAH, 49% (64) were females, while 51% (67) were males. The mean age of the population was 68.4 ± 8.02. While 80% of residents were reported to be married, 10% were unmarried, and another 10% were widowed. Majority of the participants (85%) belonged to the lower socioeconomic category, with an almost equal representation of participants' from the middle (16%) and upper (15%) socioeconomic categories by the Kuppuswamy scale.

Geriatric syndromes

Out of 131 study participants, low vision was observed in 69.5%, while 30.5% had near blindness, as per Snellen's chart. Hearing was impaired in 20.6% of the study participants. 12.9% of the participants were malnourished and 64.1% were at the risk of malnutrition, as assessed by MNA. TUG score showed that 18.3% of participants had risk of falls. Out of 131 participants, 62.6% had a score between 2 and 5, as assessed by GDS5, indicating further evaluation for depression. CI was observed in 46.6% of the study participants, as assessed by Mini-Cog [Figure 1].

Five out of 131 study participants (3.8%) had difficulty in passing urine, while 4 (3.1%) reported UI. Few participants (3.1%) reported having constipation regularly. Among the participants, 1.5% reported that they had always been subjected to physical abuse while 2.3%, 6.1%, 8.4%, and 79.4% of the study participants reported that they were subjected to physical abuse often, sometimes, seldom, and never, respectively [Figure 2]. Polypharmacy was observed in 21.4% of participants. About one-third (32%) of the participants had a history of hospitalization in the last 1 year. 23.7% of the participants reported to have trouble in sleeping almost every day, of which six reported to have the problem 3–5 times in a week. Majority (74.8%) rated themselves to be strongly competent to manage finances, while 14.5% required assistance. Similarly, 3% of the study participants were subjected to mental abuse. About one-third (35.1%) of the participants had the perception of their health as good, while 25.2% reported that their health is either bad or worse. Similarly, 27.5% were strongly satisfied in their life and 11.5% were highly dissatisfied.

The analysis revealed that only hearing had a significant association with quality of life while vision, cognition, mental health, mobility, and nutritional status did not show any statistically significant association with quality of life [Table 1]. Frailty was significantly associated with cognition ($P = 0.015$), depression ($P = 0.01$), and mobility ($P \leq 0.001$).

As depicted in Table 2, socioeconomic status (SES) was found to be significantly associated with the score ($P = 0.022$), depression ($P = 0.008$), and cognition ($P = 0.007$) of the study participants. There was no statistically significant association of age and gender with the GS.

The range of SF12 values was between 11 and 40, with a median of 30 points on 131 samples. The mean ± SD was 29.4 ± 4.3 [Table 3].

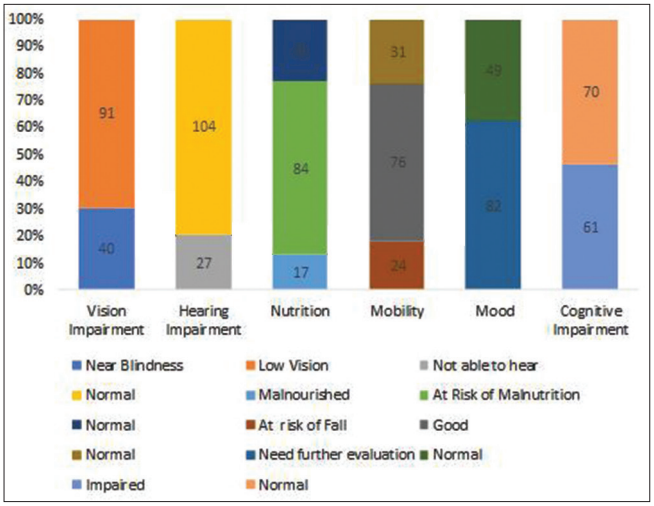

Figure 1: Frequency of geriatric syndromes among old-age home residents (assessed by the standard tool)

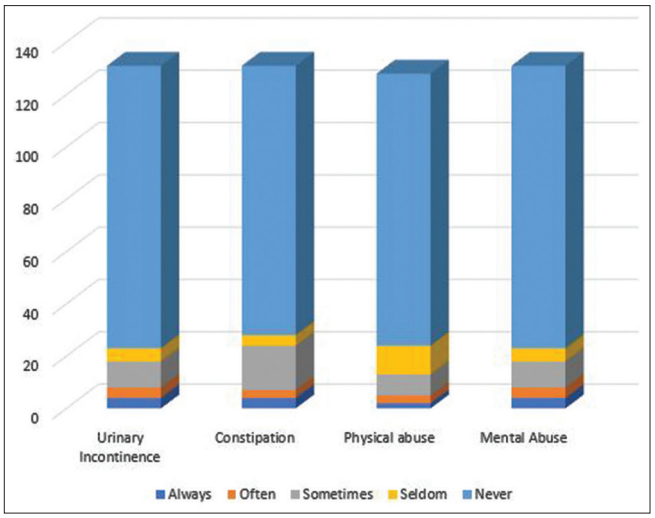

Figure 2: Frequency of geriatric syndromes among old-age home residents (assessed by ICT brief)

Discussion

The present study is the first of its kind from India, in which the frequency of GS was assessed in older people residing in OAH, a surrogate of the long-term care system of Delhi-NCR. The study revealed a high frequency of CI (46.56%), depression (62.59%), and the risk of malnutrition (12.98%) among older people residing in OAH.

CI has been identified as a major cause of disability and dependency among older people worldwide.[17] Caring for older people with CI is not only challenging but also requires dedicated and adequately trained staff which is mostly sparse in NGO-run OAH of Delhi. The frequency of CI was higher (46.56%) in this study population as compared to the previous study from southern India, where the authors reported 24% CI in OAH residents.[18]

As per *Lancet Commission* on dementia, hearing impairment was documented to be a predisposing factor for the development of CI.[19] The present study revealed a significant association between hearing and CI ($P = 0.021$) and between malnutrition and CI ($P = 0.006$), mirroring previous studies.[20] Malnutrition is known to have an important role in the progression of cognitive decline. Thus, early recognition and treatment of malnutrition and managing hearing impairment are important preventive measures that should be implemented in OAH.

Depression has been identified as the most common mental health problem in old age. About 62.59% of the respondents in the present study reported to have a higher score in the GDS-5 scale, which indicated further evaluation for depression. The probable explanation for this finding could be that the older people residing in these centers lack meaningful engagement to keep themselves happy and socially connected. They must be assessed for depression which is preventable and treatable. It has been reported that the urban mental health services in India require to strengthening to fulfill the gaps in the services provided.[21]

Fall is an important cause of morbidity and disability in the elderly, often been ignored in spite of its detrimental effect on the functionality and quality of life of older people. It has been reported that while one-third of persons 65 years of age or older fall each year, half of such cases suffer from recurrent falls.[22] The risk of falls doubles or triples if the older people have CI or previous history of falls. The present study showed that around 20% of the respondents had a high risk of falling. Corroborating previous reports,[23] the present study revealed a significant relationship between mobility and fall with hearing impairment and nutrition.

UI is often a reversible health problem which is usually under-reported due to the stigmatization associated with it. It is known to have a considerable social and economic impact on individuals and society. In spite of its detrimental effect on the quality of life of individual, studies conducted on UI are scanty. The present study explored the occurrence of UI among older people residing in OAH, using a psychometrically validated tool, ICT BRIEF-30, and showed that around 8% of the individuals had UI. These respondents need to be further targeted to provide better care and treatment. Similarly, constipation is another common concern in the elderly population. It is known that a stepwise approach is required to understand the underlying cause of constipation as it can be due to various risk factors and comorbidities.[24] Constipation can profoundly impact the quality of life of an individual and may even lead to functional decline.[25]

TUG is a quick and simple assessment which can be applied in all settings, and it does not require any specialized equipment. Thus, it has been described as a tool to assess

Table 1: Frequency of geriatric syndromes and its relations with other domains

Geriatric syndrome	Fequency of geriatric syndrome (*n*)	Cognitive impairment imparied (*n*=61) Normal (*n*=69)	Mobility	Quality of life
Vision	Near blindness (40)	0.069	0.725	0.424
	Low vision (91)			
Hearing	Not able to hear (27)	0.021*	0.045*	0.031*
	Normal (104)			
Nutrition	Malnourished (17)	0.006*	0.026*	0.421
	At risk of malnutrition (84)			
	Normal (30)			
Mobility	At risk of fall (24)	0.370		0.321
Fall	Good (76)	0.322		0.321
	Normal (31)			
Cognitive impairment	Impaired (61)		0.101	0.959
	Normal (70)			
Depression	Need further evaluation (82)	0.738	0.146	0.247
	Normal (49)			
Urinary incontinence	Always (4)			0.486
	Often (4)			
	Sometimes (10)			
	Seldom (5)			
	Never (108)			
Constipation	Always (4)			0.53
	Often (3)			
	Sometimes (17)			
	Seldom (4)			
	Never (103)			
Frailty	Frail (48)	0.015*	<0.001*	0.839
	Nonfrail (83)			

*P<0.05 has been considered to be significant

frailty in epidemiological surveys where the assessment of each of the frailty criteria can be impracticable.[16] In the present study, the frequency of frailty among older people residing in OAH was found to be 36.6% which is higher than the prevalence of frailty among community elderly in India.[26] This finding is relevant from the perspectives of care giving as frail elderly are more dependent on their care providers.[27] The present study has also revealed a significant association between frailty and cognition.[28] Studies have found a close association between physical frailty and cognitive decline and suggested that there are common underlying mechanisms between these two conditions with knock-on effect on the functionality of older people.[29] Similarly, our study also found a significant association between frailty and depression as assessed by GDS-5, which is consistent with the findings of various other researchers.[30,31]

Elder abuse is grossly under-reported as the older people themselves would prefer the matter to be undiscussed. The present study revealed that while 1.5% of the participants were always subjected to physical abuse, 3.1% were always being abused mentally. As per the report by the WHO, the rates of elder abuse are high in institutions such as nursing homes and long-term care facilities, with 2 in 3 staff reporting that they have committed abuse in the past year.[32] Appropriate interventions are warranted to ameliorate the problem of elder abuse prevailing in society.[33] A study conducted by Achappa *et al*. reported that 35.2% of OAH residents were forced to join OAH due to physical and mental abuse by their family members.[34] However, there is a scarcity of reports on elder abuse in OAHs.

In agreement with previous reports, the present study also revealed that lower SES was found to be associated with a higher prevalence of depression. It has been demonstrated in the literature that adverse economic conditions among lower-income groups may act as a predisposing factor for developing mental illness such as depression.[35] Similarly, the cognition of the study participants was also had a significant association with SES. In a study conducted by Weng *et al*., they explored the effect of lifestyle on late-life cognitive change under different SES and revealed that the people who were less financially privileged tended to have an unhealthy lifestyle and were particularly vulnerable to the adverse cognitive impacts.[36] There is

Table 2: Associations of geriatric syndromes with demographic and socioeconomic variables

Variables	Age	Gender	Socioeconomic status
Vision	0.548	0.862	0.072
Hearing	0.796	0.168	0.484
MNA	0.440	0.946	0.386
Difficulty in urination	0.761	0.884	0.518
Urinary incontinence	0.879	0.454	0.273
Constpation	0.069	0.312	0.544
TUG score	0.072	0.128	0.022
Fall	0.988	0.483	0.487
Dpression	0.595	0.269	0.008
Cognition	0.395	0.297	0.007

MNA: Mini nutritional assessment, TUG: Time up and go test

Table 3: Quality of life of the study participants as assessed by SF 12

	n	Mean±SD	p25	p50	p75	Minimum	Maximum
SF 12	131	29.4±4.3	27	30	32	11	40

SD: Standard deviation

mounting evidence on the influence of dietary patterns and exercise as an effective approach to mitigate age-associated cognitive decline.[37] Low SES may limit one's access to proper nutrition and healthy foods making the individuals vulnerable to CI.

Our study revealed a positive correlation between lower SES and decreased TUG score. It is in corroboration with the earlier reports where the investigators have shown that the SES is associated with later-life physical performance. SES is known to exert an influence early in life, with effects on overall health extending into adulthood.[38]

Quality of life is an important factor for older adults residing in OAH. The present study revealed that hearing impairment had a significant relationship with the poor quality of life. Hearing loss has been identified as the most common sensory deficit in the elderly, leading to severe social and health issues. It can also impair the exchange of information which in turn would impact their daily activities. Although the government provides hearing aid free of cost, the compliance and awareness among OAH residents are doubtful. Since hearing impairment might often go unnoticed, sensitization is needed to the OAH residents and the caretakers regarding various schemes available.

This study clearly shows that the frequency of GS is high, especially mood, depression, vision impairment, and CI, with a significant impact on functionality. It was noted that people had a high risk of falling, which might have a direct or indirect implication on the quality of life of the individual.

Strength

This study is the first of its kind to have assessed various GSs among older adults residing in OAHs of Delhi-NCR. Though this was an observational study, the research team provided comprehensive healthcare check-ups, distributed medicines, and rehabilitation to the residents.

Limitations

This cross-sectional study could not assess the causal association between various GSs. Further, the study could not explore all the GS in the participants as the assessment was restricted to the OAH settings as per their administrative protocols.

Conclusion

The present study showed high frequency of vision impairment, CI, frailty, depression, and malnutrition in older people residing in OAH. Twenty percent of the participants had functional loss due to various reasons. OAHs managed by NGOs need comprehensive health-care facilities, not only, to assess GS but also to prevent early functional loss by timely interventions. Hence, the owner/caretaker of OAHs of Delhi-NCR needs to be proactive in screening the residents for various GSs which are not only treatable but amenable for prevention also. This would help to provide quality care to the residents to live dignified aging.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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