Prevalence of Non-Communicable Disease in Elderly and Its Evaluation in Home Based Care in Urban Population

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Abstract

Background: Population ageing is one of humanity's greatest triumphs; it also presents today's societies with one of the most significant challenges. Worldwide, the number of persons over 60 years is growing faster than any other age group. With a comparatively young population, India is still poised to become home to the second-largest number of older persons in the world for the first time in human history. Ageing is a universal process and it affects each human being in the world. It is a by-product of demographic transition, i.e., the change from high fertility and mortality rates to low fertility and mortality rates. This phenomenon is more evident in developed countries but recently it is increasing more rapidly in developing countries. **Results:** In our study the proportion in the age groups i.e. (60-74 & >=85) females was higher than the males i.e. {(37.5% & 4%) vs (23.5% & 0.0%)}, whereas, in the age group 75-84, the males were higher in proportion than that of females i.e. {(25.5%) vs (9.5%)}, and this difference in proportions were statistically significant in Fisher exact test with $p < 0.0001$, at df=2. The proportion of IHD was found to be lower in females as compared to males i.e. (6.9% vs 20.4%). Only 11.85% of the study population were procuring government supply medicines free of cost, whereas 63.7% bought their medicines from private medical stores. 24.45% of the study population had to buy some of their medicines as 50% did not get government supply medicines regularly. 69% of the study population had heard about Health Insurance Schemes (HIS), out of which less than half i.e 39.13% were covered under any HIS. Out of the 54 study participants covered under HIS, 34 (62.97%) were under Private Health Insurance Schemes and 20 (37.03%) were under BSKY. No one was covered under NHPS, BKKY, or RSBY. **Conclusion:** The overall health status of the majority of females was found to be poor with the majority of them being illiterate, and

also dependent on others financially more as compared to males. So, more focus should be given to the educational, and financial awareness of females. People should also be aware of different social security schemes and HIS to remove the financial burden on them due to health expenditures. Unhealthy lifestyles like smoked tobacco and alcohol addiction were found only in males, which made them more vulnerable to develop NCDs.

Introduction

A recent World Health Organization (WHO) report on ageing and health shows that over the next 15 years the number of people aged 60 years and above is expected to increase steadily and double by 2050.[1-3]

Population ageing is one of humanity's greatest triumphs; it also presents today's societies with one of the most significant challenges. Worldwide, the number of persons over 60 years is growing faster than any other age group.[4] The number of this age group was estimated to be 688 million in 2006 by 2025, the world's population is expected to include more than 830 million people at an age of 65. With a comparatively young population, India is still poised to become home to the second-largest number of older persons in the world for the first time in human history.[5]

Ageing is a universal process and it affects each human being in the world. It is a by-product of demographic transition, i.e., the change from high fertility and mortality rates to low fertility and mortality rates. This phenomenon is more evident in developed countries but recently it is increasing more rapidly in developing countries.[6]

India is undergoing a 'demographic transition' (a growing elderly population) and an 'epidemiological transition' (an increasing predominance of chronic disease). The problems faced by this segment of the population are numerous owing to the social and cultural changes that are taking place within Indian society. Major areas of health concern among the elderly are multiple medical and psychological problems, such as hypertension, cataract, osteoarthritis, chronic obstructive airway disease, ischemic heart diseases, diabetes, benign prostatic hypertrophy, dyspepsia, constipation, and depression.[7]

The rise of non-communicable diseases has challenged the foundation of public health among all the new threats which have emerged. After the 19th century, there was an improvement in health status and life expectancy due to changes in living conditions, hygiene, and nutrition. These changes have resulted in the reduction of infectious diseases but an increase in chronic diseases.[8,9] Non-communicable diseases also known as chronic diseases tend to be of long duration and genetic, behavioral, environmental, and physiological factors are the main contributing factors. The main types of NCDs are cardiovascular diseases, chronic respiratory diseases, cancer, stroke, and diabetes. Globally 41 million deaths are due to NCDs, which is about 71% of all deaths.[10]

As NCDs lead to long-term treatment and out-of-pocket expenditure, it leads to catastrophic expenditure and impoverishment. This is important in developing countries that are already facing a triple burden of communicable, non-communicable, and emerging diseases. It was estimated that an amount of USD237 billion was lost in India from 2006 to 2015 because of premature deaths due to NCDs.[11]

The elderly suffer from multiple chronic diseases. They need long-term and constant care. Their health problems also need care from various disciplines, e.g. ophthalmology, orthopedics,

psychiatry, cardiovascular, dental, and urology to name a few. Thus, a model of care providing comprehensive health services to the elderly at all levels of healthcare delivery is imperative to meet the growing health need of the elderly. Moreover, the restricted and bed-bound elderly need care close to their homes.[12]

Home-based care which is planned and coordinated will help the elderly people receive the needed services while remaining in their own homes. It is usually less expensive, and more convenient.[13]

Materials and Methods

This is a Community-based Cross-Sectional Study was carried out from April 2021 to October 2022 among Individuals aged 60 years and above with NCD residing in the study area.

Inclusion Criteria
Age ≥ 60 years with NCD and those who will give consent.

Exclusion Criteria
Not willing to give consent or severely ill individuals.

Data Collection
Informed/verbal consent prior to the interview was taken (Annexure-III). As there was no proper listing and numbering of houses in most of these areas so a central landmark was chosen, then by pen technique the streets/lanes were selected and all consecutive houses on the selected street were visited till the required number of study subjects were obtained, all the members (aged 60 above) of the family who present at the time study and provided verbal/informed consent were included. All the subjects were personally contacted in their houses, examined, and interviewed using the pretested semi-structured questionnaire. First of all, on visiting the family, the socio-demographic profile of the family was taken using the Kobo-collect application in the android mobile phone, which was developed by the Kobo tool box and persons aged 60 years above were interviewed as per the questionnaire. All the recordings were entered in the Kobo collect app.

A Questionnaire-cum-Study Schedule was prepared based on the "Economic and Health Survey on India's Oldest Old (80+) - Needs, Care & Access" by HelpAge India.[6]

A pilot study was conducted on 25 elderly individuals from one ward. Based on the pilot study, appropriate changes were made to the initial questionnaire and a final questionnaire was prepared and used for the study.

Data were collected under the following sections
1. Socio-Demographic Profile
2. Personal History
3. Type of NCDs suffering from and medications being used
4. Home-Based Care
5. Out-of-pocket expenditure
6. Social Security Schemes.

Results

Table 1: Distribution of Study Population according to Age & Gender

Age Category (in years)	Male (%)	Female (%)	Total (%)	Test of significance
60 - 74	47(23.5%)	75(37.5%)	122(61.0%)	Fisher exact test with p < 0.0001, at df=2
75 - 84	51(25.5%)	19(9.5%)	70(35.0%)	
≥ 85	0(0.0%)	8(4.0%)	8(4.0%)	
Total	102(51%)	98(49%)	200(100%)	
Mean Age ± SD (in years)	70.50±7.52	73.04±5.26	71.74±6.62	Independent sample Mann-Whitney U test with P=0.001

Table no. (1) showed that the proportion in the age groups i.e. (60-74 & >=85) females was higher than the males i.e. {(37.5% & 4%) vs (23.5% & 0.0%)}, whereas, in the age group 75-84, the males were higher

in proportion than that of females i.e. {(25.5%) vs (9.5%)}, and this difference in proportions were statistically significant in Fisher exact test with p < 0.0001, at df=2. The difference in the mean age between gender was found to be statistically significant in the Independent sample Mann-Whitney U test with P=0.001.

The mean age of the study population was 71.74 ± 6.62 years. The majority, i.e. 61% belonged to the age group of 60 to 74 years ("Young Old"), followed by 35% in the age group of 75 to 84 years ("Middle Old"), while only 4% were equal to or above the age of 85 years ("Oldest Old").

Table 2: Distribution of Study Population according to Socio-Economic Status (n=200)

Socio-Economic Class		Frequency (%)
I	Upper	60(30%)
II	Upper Middle	46(23%)
III	Middle	49(24.5%)
IV	Lower Middle	25(12.5%)
V	Lower	20(10%)

A large proportion of the study population belonged to Class I (30%), followed by Class III (24.5%), Class II (23%), and Class IV (12.5%), while only 10% belonged to Class V.

Table 3: Gender-wise Distribution of Study Population according to Type of Addiction / Habituation

Type of Addiction (n=200)		Female	Male	Total (n=200)	χ2 at df, p-value
Smoked Tobacco	No	102 (51.00%)	77 (38.50%)		χ2=24.421, df=1, p<0.0001*
	Yes	0 (0.00%)	21 (10.50%)	21 (10.5%)	
Smokeless Tobacco	No	83 (41.50%)	85 (42.50%)		χ2=1.06, df=1 P= 0.3
	Yes	19 (9.50%)	13 (6.50%)	32 (16%)	
Alcohol	No	102 (51.00%)	63 (31.50%)		χ2=44.15, df=1 P<0.0001*
	Yes	0 (0.00%)	35 (17.50%)	35 (17.5%)	
* p value showing significant result					

Table(3) showed that there were 10.5% of males addicted to smoked tobacco, while females were not addicted to this, and this difference in proportion is statistically significant in the Chi-square test with χ2=24.421, df=1, p<0.0001. Similarly, there were 17.5% of males addicted to alcohol, while females were not addicted to this, and this difference in proportion is statistically significant in the Chi-square test with χ2=44.15, df=1, p<0.0001. But, it was observed that smokeless tobacco addiction was found in both males (6.5%) and females (9.5%), and this proportionate difference is not statically significant in the Chi-square test of significance. Only 17.5% consumed alcohol and 10.5% were smokers while 16% were habituated to smokeless tobacco.

Table 4: Gender-wise Distribution of Study Population according to Self-Perceived Overall Health Status

Overall Health Status	Male (%) (n=98)	Female (%) (n=102)	Total (%) (n=200)	χ2, df, p-value
Excellent	0 (0%)	0 (0%)	0 (0%)	

Very Good	38 (38.8%)	25 (24.5%)	63 (31.5%)	χ2 =34.399, df=4 p<0.0001**
Good	15 (15.3%)	35 (34.3%)	50 (25%)	
Fair	32 (32.7%)	8 (7.8%)	40 (20%)	
Poor	13 (13.3%)	34 (33.3%)	47 (23.5%)	
Total	98 (100%)	102 (100%)	200 (100%)	
**Highly statistically significant in Chi-square/Fisher exact test.				

Table(4) enumerated that, the overall health status as "Very good" was perceived more by males than females (38.8% vs 24.5%), whereas "Poor" health status perception was more in case of females than males (33.3% vs 13.3%) and this difference in proportions were statistically significant in Chi-square test with χ2 =34.399,df=4, p<0.0001. The majority of the study participants (31.5%) rated their overall health status as "Very good", followed by 25% as "Good", 23.5% as "Poor" and 20% as "Fair". No participants told that their health status as "Excellent".

Table 5: Gender-wise NCD distribution of Study Population

Type of NCD	Female (n=102)	Female (%)	Male (n=98)	Male (%)	χ2 at df=1, #p-value
Diabetes	49	48.0%	47	48.0%	
Hypertension	62	60.8%	61	62.2%	
Ischemic Heart Disease#	7	6.9%	20	20.4%	χ2 = 7.853, p= 0.005
Stroke#	6	5.9%	0	0.0%	Fisher exact test statistic value is 0.0291. The result is significant at p < .05.
Arthritis	35	34.3%	39	39.8%	
COPD	7	6.9%	15	15.3%	
Cataract	22	21.6%	32	32.7%	
Hearing loss	22	21.6%	14	14.3%	
BPH	NA		20	20.4%	
Anaemia#	27	26.5%	0	0.0%	χ2 = 29.990, p < 0.0001
Dementia	8	7.8%	13	13.3%	
* There were no cancer cases were found in this study # showing P value with p<0.05					

Table no. (5) enumerated that, the proportion of IHD was found to be lower in females as compared to males i.e. (6.9% vs 20.4%) similar to the findings of Kanitkar S.A. et al.[92] where it was (10% in females vs 15.8% in males), while in case of anaemia, only females were found to be anaemic i.e. 26.5% which is nearly the same to the study of Milman N, Schultz Larsen K.[105] where the prevalence of anaemia was higher in females as compared to males, and these differences in proportions were statistically significant in the Chi-square test with χ2 value = 7.853, p= 0.005, at df=1 and χ2 value = 29.990, p < 0.0001, at df=1 respectively.

Table 6: Distribution of Study Population according to Source of Medication and Regularity of Government Supplied Medication

Source of Medications (n=135)	Frequency (%)
Govt. Supply	16 (11.85%)
Private Medical Store	86 (63.70%)
Both	33 (24.45%)
Total	135 (100%)
Govt. Supply Medications (n=16)	
Regular	8 (50%)
Irregular	8 (50%)
Total	16 (100%)

Only 11.85% of the study population were procuring government supply medicines free of cost, whereas 63.7% bought their medicines from private medical stores. 24.45% of the study population had to buy some of their medicines as 50% did not get government supply medicines regularly.

Table 7: Distribution of Study Population according to Health Insurance Schemes (HIS) (n=200)

Heard about HIS (n=200)	Frequency (%)
Yes	138(69%)
No	62(31%)
Total	200(100%)
Covered under HIS (n=138)	
Yes	54(39.13%)
No	84(60.86%)
Total	138(100%)
Type of HIS covered under (n=54)	
RSBY	0(0%)
BKKY	0(0%)
NHPS	0(0%)
BSKY	20(37.03%)
Private	34(62.97%)

69% of the study population had heard about Health Insurance Schemes (HIS), out of which less than half i.e (39.13%) were covered under any HIS. Out of the 54 study participants covered under HIS, 34 (62.97%) were under Private Health Insurance Schemes and 20 (37.03%) were under BSKY. No one was covered under NHPS, BKKY, or RSBY.

Discussion

Prados-Torres et al.[14], in their study, also reported a very low prevalence – only 2.7% who took alcohol; 58.97% were using some or the other form of tobacco (64.74% of males and 55.38% of females). In another similar study, conducted in an urban slum of Pune city by Zhu W et al.[15], alcohol intake and smoking was seen only in males (42.1% and 44.7%, respectively), and 68.4% of the males and 17.7% of the females were addicted to tobacco chewing.

S A similar study, conducted by Yi JY et al.[16] in urban slums of Jorhat, Assam, also found that most elderly (56.8%) rated their overall health status as "moderate", while 25.6% rated as "good" and only 17.6% as "bad".

Similar to the above observation with reference to anaemic cases, in the study of Sun XC et al.[17], it was found that the females were more anaemic than males i.e. 24.35% vs 8.06% and this difference was statistically significant with p=0.001.

The prevalence of Diabetes and HTN was found to be very high in both genders, but there were no

gender-wise significant differences, i.e. (48% vs 48% for Diabetes and 60.8% vs 62.2% for HTN). Similarly, in the study of Sun XC et al.[17] hypertension was most commonly seen in the geriatric population, followed by cataract and Diabetes mellitus with no gender-wise significant differences i.e (31.73% vs 30% for Diabetes and 35.21% vs 44% for Hypertension).

The prevalence of Cataract and hearing loss were also found to be higher in both females & males, i.e. (21.6% & 32.7% for Cataract and 21.6% & 14.3% for hearing loss). And there was no statistically significant difference for these NCDs prevalence wrt. gender. A similar higher prevalence for cataract was observed in both males & females (34.84% & 33.04%), in the study of Sun XC et al.[17]

Similarly, the prevalence of Arthritis was also found to be high in both gender, and there was gender-wise no statistically significant difference, i.e. (34.3% vs 39.8%) in contrast to the study of Sun XC et al.[17] where more females (40%) were suffering from Arthritis as compared to males (10%).

20.4% of males were suffering from BPH which was higher as compared to the study of Sun XC et al.[17] where, 14.51% of males were suffering from BPH.

imilarly the study of Angkurawaranon C et al.[18] revealed that 21.3% of people from the study population in the 60 to 69 age group and 30.6% in the above 70 years age group people were suffering from 2 or more NCDs.

In another study by Nguyen H et al.[19], it was seen that 18.3% of the study population in the 70 to 74 age group were suffering from 2 or more NCDs as against 17% in the above 75 years age group showing a contrasting trend to the present study.

Conclusions

The present study revealed the prevalence of non-communicable diseases in the elderly and its

evaluation in home-based care in the urban population of Berhampur city. The changing pattern of different socio-demographic factors, along with the ignorance of healthy lifestyle practices and available health care services, had made them vulnerable to develop NCDs, along with that the spectrum of HBEC services delivered by Govt. was limited which prone them to a high financial burden to avail such services through private setups.

The overall health status of the majority of females was found to be poor with the majority of them being illiterate, and also dependent on others financially more as compared to males. So, more focus should be given to the educational, and financial awareness of females. People should also be aware of different social security schemes and HIS to remove the financial burden on them due to health expenditures. Unhealthy lifestyles like smoked tobacco and alcohol addiction were found only in males, which made them more vulnerable to develop NCDs. The prevalence of multiple NCDs also increased with advancing age and among higher SES. So, there is a need for public health interventions to focus on high-risk groups for de-addiction, screening for early diagnosis & treatment for common NCDs to reduce the risk of end-organ complications.

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