Interplay of multimorbidity and polypharmacy on a community dwelling frail elderly cohort in the peri-urban slums of Delhi, India

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Abstract

The United Nations Population Fund suggests that the number of elderly persons is expected to grow to 173 million by 2026. The aging phase is further made adverse by conditions such as failty, multimorbidity and polypharmacy. **Aim:** To assess the status and associates of frailty among elderly (>60 years) residing in a peri-urban slum area in Delhi by using the EDMONSTON Frail scale and evaluate the interplay of multimorbidity (MM) and polypharmacy (PP) on the frail pre-frail spectrum of the community-dwelling elderly cohort. **Method:** A community study from Dec 2018 till July 2019 with a sample size of 300 participants who were willing and consented to the study. Frailty was assessed and the STOP criteria was used for PP assessment. **Result:** There were 76 frail, 51 pre-frail, and 173 non-frail elderly. A higher prevalence (51%) of multimorbidity among the pre-frails and a higher probability (74%) of polypharmacy among the frails were found. Of the total in the frail-prefrail spectrum (127), 29.1% had multimorbidity (MM) and 39.4% had polypharmacy (PP). MM and PP were significantly higher among the old. Factors such as sex, marriage, loneliness, social circle, and education also had a positive bearing on the frailty-prefrailty spectrum. The working group had an increased (86%) probability of PP with statistical significance. Regression analysis depicted significant increased odds of MM and PP among female, illiterate, very old, lone, and single subjects. **Discussion and Conclusion:** Thus, we recommend earlier and timely intervention for the frail-prefrail which can revert their adversities.

Keywords: Elderly, frailty, multimorbidity, polypharmacy

Introduction

An important issue throughout the world today is aging which is emerging as a serious public health concern. India's population census of 2011 reveals a zooming value of 104 million elderly aged >60 years with 53 million females and 51 million males. A report released by the United Nations Population Fund and Help Age India suggests that the number of elderly persons is expected to grow to 173 million by 2026. Both the share and size of the elderly population is increasing over time.[1] This increase is a matter of concern since it also welcomes dependency, frailty, health concerns, multimorbidity, and other such adversities which is beyond the horizon of tackle of many countries. No one country is prepared enough to aid this population group arm and embrace death gracefully.

Adversties and Aging

Frailty is multidimensional and characterized by unfavorable outcomes, particularly reduction of survival time. Problems

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more frequently affect individuals due to a decline in their reserve capacity for multiple physiological systems. When this reserve capacity has decreased to a critically low point, even small disturbances can lead to a series of adversities. Broadly speaking, it can also lead to increased rates of disabilities and healthcare costs, thereby, adversely affecting the entire society as a whole. A study by Leme DEC et. al showed that the frail individuals attending the geriatric outpatient unit had the lowest survival time.[2,3]

Multimorbidity is the co-occurrence of two or more chronic conditions and has been estimated to affect up to 95% of the primary care population aged 65 years and older worldwide.[4,5] In India, with the higher younger population, the projected magnitude can be enormous with a result that the unprepared health system and limited resources could cumulatively add to the adverse impacts. Considerable corpus of primary care research over decades has been conducted in developed countries with a focus tinged on this area. Estimates show figures ranging from 39.5% in Spain to 13% in the Netherlands.[5-9] Middle income countries such as Ghana, Brazil, and South Africa have reported prevalence of multimorbidity as high as 38.5%.[10-12] The number of people under the fangs of multimorbidity is only going to increase around the world. Therefore, we need to introduce more sustainable models of care for multimorbidity. However, the problem statement is that we do not know enough about what to prioritise and intervene.[13]

Polypharmacy is yet another detriment which is gradually taking an accelerated toll and becoming a big problem in geriatrics, more so because it is associated with greater healthcare costs and substantial risk of adverse drug reactions and drug interactions. Besides, inappropriate prescribing leading to detrimental effects on elderly is also a challenge. From among the different tools to assess the appropriateness of prescription in geriatrics, we preferred using the START (screening tool to alert to right treatment) and STOPP criteria developed in 2008 in Ireland. Studies in South India have narrated a 66% prevalence of polypharmacy among the geriatric population in India.[14-18]

Similar such studies in India show how among 814 elderly patients in hospitals, 70% were on systemic antibacterials which was the most commonly prescribed therapeutic class of medications followed by pantoprazole, i.e. 61.2%.[14,19,20]

The operational model proposed by Linda Fried and collaborators shows that there is an association between the frailty syndrome and mortality, in elderly people attended in low-complexity healthcare in the community.[21,22] However, the impact on survival of elderly people either in isolation or as a superimposition on multimorbidity or polypharmacy is still a lesser known fact. The recent 2016 study conducted by WHO's SAGE (Study on Global Ageing and Adult Health) implemented six countries including India to examine the pattern of frailty and found that India has the lowest percentage (44.5%) of people without frailty. This is a matter of concern for us and we need to pace up research in this direction. This would provide us a window to peek and assess the present policies and interventions and help us differentiate

their adequacy or insufficiency, thereby providing us with a scope for improvement.[23,24]

Literature worldwide shows positive association of multimorbidity, polypharmacy or quality of life with frailty but most studies have been done in isolation, wherein, each contributing factor has been studied in separation.[14,25,34]

Moreover, the research done so far in this arena is cornered to nations where the problem statement is lesser. India being on the giant side of the problem has minimal studies to support these aspects of the dependant population. Indian studies done so far either consider patients who attend the tertiary health care settings or physicians. We attempted to replicate the scenario in a primarycare setting with meager resources and facilities and thus resorted to conduct a community based study in an already segregated frail population which was the first of its kind. This study thus aims to find out the interrelation of factors contributing to frailty such as multimorbidity and polypharmacy.

Objective

- To assess the status and associates of frailty among elderly (>60 years) residing in a peri-urban slum area in Delhi by using EDMONSTON Frail scale.
- To evaluate the interplay of multimorbidity and polypharmacy on the frail–pre-frail spectrum of the community dwelling elderly cohort.

Methodology

The study was carried out in a community setting and a field practice area in a rural health and training center, Madanpur Khadar, attached to the department of Community Medicine, HIMSR, Jamia Hamdard – New Delhi. An extensive review of literature was done which showed a wide ranged prevalence of 30–60 percentage of frailty among elderly.[24,32-35] Considering a prevalence of 30 percent among the frail olds and a confidence limit at 5% with 95% interval, we apply the Schwartz formulae: $n = z^2 P (1-p) \times DEFF/d^2$ where,

n = sample size
z = 1.96 (95% confidence interval)
p = prevalence = 30%
1- p = 70%
d = allowable error = 6%

Assuming a nonresponse rate of 10 percentage and rounding it off to a wholesome value, we determined the final sample size to be 300. The study was carried out from Dec 2018 till July 2019 with those willing to participate in the study and offered their consent.

Terms and definition

Frail: The EDMONSTON Questionnaire helped in segregating the groups into frail, prefrail, and nonfrail categories.[36,37]

Multimorbidity [depicted as MM]: The coexistence of multiple chronic diseases and medical conditions in the same individual (usually defined as two or more conditions) was used as the accepted definition. This was either self reported or taken up from records and prescriptions.[38-43]

Polypharmacy [depicted as PP]: Polypharmacy was considered as having 5 or more medications as per prescription. Medication appropriateness for each patient was analyzed separately based on their medical history and clinical findings by applying the START and STOPP criteria.[14,17,44] The eligibility criteria of the study participants were age >60 years and a resident of that community for atleast the last 3 months and a consent to participate in the study. All others not willing to participate and those who were terminally ill or had serious cognitive disabilities that prevented comprehension and participation in the assessment were excluded from the study.[45]

Analysis was done using the SPSS version 22. Quantitative data was represented using frequencies, standard deviation, whereas the qualitative data was represented using the Chi-square test of significance. The variables included in the univariate regression analysis which had a *P* value of < 0.2 were selected further for the multivariate regression analysis using the stepwise forward method. The level of significance adopted for all statistical tests was *P* value < 0.05.

Necessary ethical approval was taken from the institutional ethical committee and there was no conflict of interest.

Figure 1: Prevalence of frailty among elderly population

Result

The study on 300 individuals in the geriatric age group showed that there were 76 frail, 51 pre-frail, and rest 173 non-frail elderly. The pie chart in Figure 1 depicts this as 25% frail elderly, 17% pre-frail elderly, and 58% non-frail elderly among the study population.

Table 1 shows a higher prevalence (51%) of multimorbidity among the pre-frails and a higher Probability (74%) of polypharmacy among the Frails. The hypothesis about polypharmacy was statistically significant at a *P* < 0.05.

Table 2 depicts the association of the sociodemographic categorical values with MM and PP and suggests the significant statistical association as derived by the Chi-square analysis with *P* value < 0.05. It was found that, out of the total in the frail-prefrail spectrum (127), 29.1% had multimorbidity (MM) and 39.4% had polypharmacy (PP).

MM was higher among the 60–65 year old (57%) and decreased among the 65–75 year olds (18%) and then showed an increase again to 24% among the late elderly. Among those above 75 years (late elderly), it was found that there were 63.2% elderly who were multimorbid as compared to just 32% in the age group 60–65 and 17% among the early elderly and this difference was statistically significant. With regards to polypharmacy, we found a significantly higher percentage of the late elderly taking more number of medicines on a regular basis. Females were significantly much more prone than their male counterparts. Similarly, married were found to have slightly higher percentage of MM than those who were single. However, the scenario in PP was opposite to this; with single elderly having greater tendency of PP. The factors Income, Education and Occupation did not bear any significant association with multimorbidity. However, illiterates had a significant association with polypharmacy and the tendency to use multiple drugs was found to decrease with an increase in level of education. Striking increase in polypharmacy was found among those who were non-working (86%) as compared to the working group, and this association bore statistical significance.

Figure 2 depicts that among the multimorbids, 67% often forgot to take medicine, 24% had mobility restrictions and 35% were alone. Nearly 92% didn't have a fixed place of stay. From among the polypharmacy elderly, 53% and 30% often forgot medications and had mobility restrictions respectively, whereas 16% were alone and 80% didn't have a fixed place to stay and were away from their place of origin.
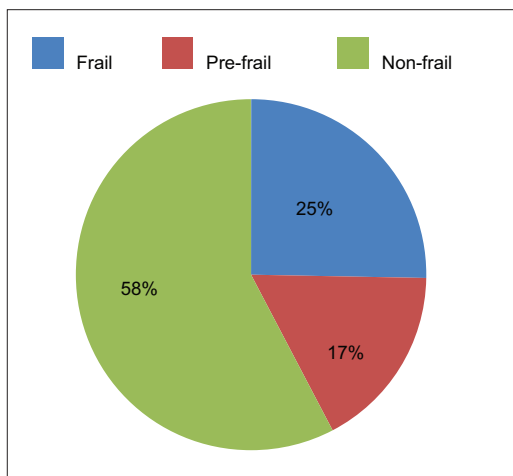
Table 1: Association of Multimorbidity (MM) and Polypharmacy (PP) with the Frail-Prefrail Spectrum					
Trait	**MM (%)**		**Total**	**PP (%)**	
	Yes	**No**		**Yes**	**No**
Frail	18 (48.6%)	58 (64.4%)	76 (59.8%)	37 (74%)	39 (50.6%)
Pre-frail	19 (51.4%)	32 (35.6%)	51 (40.2%)	13 (26%)	38 (49.4%)
Total (Frail + Prefrail)	37 (100%)	90 (100%)	127 (100%)	50 (100%)	77 (100%)
Chi square, df, *P*	2.7, 1, 0.07			6.9, 1,0.009	

Degree of Freedom, Probability Value, Fisher exact test applied for cell values <5

Figure 2: Trait specifics among the multimorbid and polypharmacy elderly in the frail–prefrail spectrum
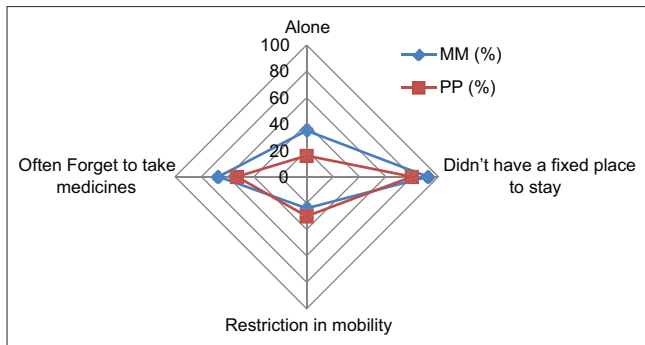
Regression analysis using s trength of association and odds ratio found that with a reduction in age, there was a 10 percent and 30 percent reduction in MM for the early elderly and late elderly which was statistically significant. The same was however not true for polypharmacy and didn't bear any significance. There was significant manifestion among the illiterates who had a 90 percentage increased chance of MM as compared to the high school literates. Literacy levels among polypharmacy bore no significance however.

Those who were occupied in any way or the other had a six times increased probability of MM and a 14 times increased probability of PP which bore statistical significance in both. Similar was the manifest for the lone individuals, who had highly increased tendency for MM and PP with significant *P* values less than 0.05.

Those who often forgot taking medications had a four times increased odds of MM as compared to those who remembered and had a 5 percent decreased odds of PP at significant *P* value levels.

Not having or having few trustworthy friends heavily increases the odds of MM as well as PP among the individuals, thereby rejecting null hypothesis at *P* value < 0.05.

It was found that those who were often sad had a 5 times increased odds of MM at significant *P* values, whereas those who had any bereavement in the past had increased odds of having polypharmacy which was statistically significant as well.

Discussion

The study in community setting was undertaken to assess the frailty status among elderly and analyze its associates with multimorbidity and polypharmacy. Of 300 elderly who were taken up by simple random sampling, that there were 25 percent frails and 17 percent of pre-frails; i.e. 127 elderly were in the frail-prefrail spectrum of our study. The worldwide systematic review and meta-analysis by Siriwardhana *et al.* with most studies from upper middle income group found that the prevalence of frailty ranged from 4% (China)–51% (Cuba), and that of

prefrailty ranged from 13% (Tanzania)–71% (Brazil) irrespective of the frailty assessment method. When they tried to restrict the studies to the use of fried phenotype method for frailty asssessment, it was found that the prevalence of frailty ranged from 4 (China) to 26% in India.[46] In India, and more specifically in Northern India, there are fewer studies which could be used for a baseline comparison since the observational evidence on various dimensions of well-being of elderly is sparse.[37] The recent Longitudinal Ageing study in India (LASI) and the WHO – SAGE has however reignited the scope and possibility of in-depth analysis. Among the SAGE states, the highest mean frailty scores were seen in West Bengal (0.23), Karnataka (0.23), following Assam (0.22) and Maharashtra (0.22), and the lowest in Uttar Pradesh (0.21) and Rajasthan (0.21). Although extensive, the SAGE study lacked the evidence for establishing a cause–effect relationship, thereby stressing the need for better cohort studies.[47]

Frailty-prefrailty is a spectrum which lacks a universal common concept of definition. One potential source of bias in our study could be the various ethnicity and background of the migratory population residing in the border study area.[37,47] Besides, the primary care setting for the national capital Delhi might be quite different from the other primary care settings.

Multimorbidity and frailty

The prevalence of MM among frail and pre-frail was 49% and 51% respectively as depicted in Table 1. If we consider the frail–prefrail spectrum, the prevalence of MM and PP were found to be 29.1% and 39.4%, respectively, as depicted in Table 2. Our study showed the multimorbidity to be higher among 60–65 year old (57%), females and married which probably might be due to the scope of early and easy detection. Study by Glynn *et al.* showed a prevalence of 66% among individuals above 50 years.[48] Minor differences in the prevalence rates might be attributed to the study population selected, which was >60 years in our study, and as per our study objective, we found out the MM among the frail–prefrail spectrum.

As per Figure 2, 67% of the MM often forgot to take medicine, 24% had mobility restrictions, 35% were alone, and nearly 92% did not have a fixed place of stay. Odds Ratio by a regression analysis showed that with a reduction in age, there was a 10 percent and 30 percent reduction in multi morbidity for the early elderly and late elderly which was statistically significant as well. The same is significantly manifested among the illiterates, who have a 90 percentage increased chance of multimorbidity as compared to the high school literates as per Table 3.

Those who were occupied in any way or the other had a 6 times increased probability of MM and the lonely individuals had a highly increased tendency for MM with significant *P* values.

Forgetting to take medications had a 4 times increased odds of MM as compared to those who remembered, as was not having

Factor	Variables	Multimorbidity (MM)			Polypharmacy (PP)		
		Yes	No	Total	Yes	No	Total
Age	60-65	21	45	66	29	37	66
	(% within Age)	31.8%	68.2%	100%	43.9%	56.1%	100%
	(% within MM/PP)	56.8%	50%	52%	58%	48.1%	52%
	65-75(early elderly)	7	35	42	12	30	42
	(% within Age)	16.7%	83.3%	100%	28.6%	71.4%	100%
	(% within MM/PP)	18.9%	38.9%	33.1%	24%	39%	33.1%
	75 above (late elderly)	9	10	19	9	10	19
	(% within Age)	63.2%	36.8%	100%	47.4%	52.6%	100%
	(% within MM/PP)	24%	9%	15%	18%	13%	15%
	Total	37	90	127	50	77	127
	(% within Age)	29.1%	70.9%	100%	39.4%	60%	100%
	(% within MM/PP)	100%	100%	100%	100%	100%	100%
	χ^2, df, *P* value-6.45, 2, 0.04				χ^2, df, *P* value-3.1, 2, 0.2		
Sex	Male	9	45	54	16	38	54
	(% within Age)	16.7%	83.3%	100%	29.6%	70.4%	100%
	(% within MM/PP)	24.3%	50%	42.5%	32%	49.4%	42.5%
	Female	28	45	73	34	39	73
	(% within Age)	38.4%	61.6%	100%	46.6%	53.4%	100%
	(% within MM/PP)	75.7%	50%	57.5%	68%	50.6%	57.5%
	Total	37	90	127	50	77	127
	(% within Age)	29.1%	70.9%	100%	39.4%	60.6%	100%
	(% within MM/PP)	100%	100%	100%	100%	100%	100%
	χ^2, df, *P* value: 7.07, 1, 0.008				χ^2, df, *P* value: 3.7, 1, 0.05		
Marital Status	Married	20	70	90	31	59	90
	(% within Age)	22.2%	77.8%	100%	34.4%	65.6%	100%
	(% within MM/PP)	54.1%	77.8%	70.9%	62%	76.6%	70.9%
	Single (Divorce/widow)	17	20	37	19	18	37
	(% within Age)	45.90%	54.10%	100%	51.40%	48.60%	100%
	(% within MM/PP)	45.90%	22.20%	29.10%	38%	23.40%	29.10%
	Total	37	90	127	50	77	127
	(% within Age)	29.10%	70.90%	100%	39.40%	60.60%	100%
	(% within MM/PP)	100%	100%	100%	100%	100%	100%
	χ^2, df, *P* value: 7.1, 1, 0.008				χ^2, df, *P* value: 3.1, 1, 0.07		
Education	Illiterate	30	67	97	43	54	97
	(% within Age)	30.90%	69.10%	100%	44.30%	55.70%	100%
	(% within MM/PP)	81.10%	74.40%	76.40%	86%	70.10%	76.40%
	Up to Secondary level	4	19	23	4	19	23
	(% within Age)	17.40%	82.60%	100%	17.40%	82.60%	100%
	(% within MM/PP)	10.80%	21.10%	18.10%	8%	24.70%	18.10%
	High school and above	3	4	7	3	4	7
	(% within Age)	42.90%	57.10%	100%	42.90%	57.10%	100%
	(% within MM/PP)	8.10%	4.40%	5.50%	6%	5.20%	5.50%
	Total	37	90	127	50	77	127
	(% within Age)	29.10%	70.90%	100%	39.40%	60.60%	100%
	(% within MM/PP)	100%	100%	100%	100%	1005	100%
	χ^2, df, *P* value: 2.3, 2, 0.3				χ^2, df, *P* value: 5.6, 2, 0.05		
Occupation	Working	5	7	12	9	3	12
	(% within Age)	41.70%	58.30%	100%	25%	75%	100%
	(% within MM/PP)	13.50%	7.80%	9.40%	3.90%	18%	9.40%
	Not working	32	83	115	41	74	115
	(% within Age)	27.80%	72.20%	100%	35.70%	64.30%	100%
	(% within MM/PP)	86.50%	92.20%	90.60%	82%	96.10%	90.60%
	Total	37	90	127	50	77	127

Table 2: Association of Socio-demographic details of Frail-Prefrail Elderly with Multimorbidity (MM) and Polypharmacy (PP)

Contd...

Factor	Variables	Multimorbidity (MM)			Polypharmacy (PP)		
		Yes	**No**	**Total**	**Yes**	**No**	**Total**
	(% within Age)	29.10%	70.90%	100%	39.40%	60.60%	100%
	(% within MM/PP)	100%	100%	100%	100%	100%	100%
		χ^2, df, *P* value: 1.01, 1, 0.3			χ^2, df, *P* value: 7.04, 1, 0.01		
Income	<5000	9	19	28	14	14	28
	(% within Age)	32.10%	67.90%	100%	50%	50%	100%
	(% within MM/PP)	24.30%	21.10%	22%	18.20%	28%	22%
	More than 5000	28	71	99	36	63	99
	(% within Age)	28.30%	71.70%	100%	36.40%	63.60%	100%
	(% within MM/PP)	75.70%	78.90%	78%	72%	81.80%	78%
	Total	37	90	127	50	77	127
	(% within Age)	29.10%	70.90%	100%	39.40%	60.60%	100%
	(% within MM/PP)	100%	100%	100%	100%	100%	100%
		χ^2, df, *P* value: 0.2, 1, 0.6			χ^2, df, *P* value: 1.7, 1, 0.2		

Table 2: Contd...

MM-Multimorbidity, PP – Polypharmacy, χ^2 – Chisquare, df – degree of freedom, *P* value-probability value, fischer t test applied for cell value less than 5

Table 3: Regression Analysis and Strength of Association of Multimorbidity and Polypharmacy among the Frail and Pre-frails

Traits	Categories	B-coefficient, OR- Odds Ratio, *P*	
		Multimorbidity	**Polypharmacy**
Age	60-65	-1.1, 0.3, [0.1]	0.5, 1.6, [0.4]
	65-75	-2.4, 0.1, [0.008]	-0.6, 0.6, [0.4]
	>75	0,1 (Ref)	0,1 (Ref)
Education	Illiterate	-2.8, 0.1, [0.03]	2.01, 7.4, [0.5]
	Uptill Secondary	-3.2, 0.4, [0.02]	0.1,1.1,[0.9]
	HighSchool & above	0,1 (Ref)	0,1 (Ref)
Occupation	Engaged	1.8,5.9, [0.08]	2.6,14.1, [0.02]
	Not engaged	0,1 (Ref)	0,1 (Ref)
Alone	Yes	3.5, 34, [0.001]	0.2,1.1, [0.01]
	No	0,1 (Ref)	0,1 (Ref)
Do you forget medications?	Yes	1.4, 4, [0.04]	-0.7, 0.5, [0.2]
	No	0,1 (Ref)	0,1 (Ref)
Have trustworthy friends	None	0.2, 1.2, [0.8]	0.1, 1.1, [0.9]
	Few	15.6, 648, [0.000]	15.3, 45, [0.00]
	Many	0,1 (Ref)	0,1 (Ref)
Do you feel sad/depressed often	Yes	1.7, 5.3, [0.01]	1.1, 2.8, [0.1]
	No	0,1 (Ref)	0,1 (Ref)
Do you know about any govt. schemes	Yes	0.8, 2.2, [0.07]	1.3, 3.8, [0.01]
	No	0,1 (Ref)	0,1 (Ref)
Transport used for going to health checkup	Walk	-0.2, 0.8, [0.7]	-2.1, 0.1, [0.04]
	Public	-0.3, 0.7, [0.6]	-3, 0.1, [0.01]
	Own	0,1 (Ref)	0,1 (Ref)
Any bereavement in past?	Yes	0.5, 1.7, [0.1]	1.2, 2.8, [0.03]
	No	0,1	0,1

or having few trustworthy friends did as compared to having a friendly social circle. Those who were often sad also had a 5 times increased odds of MM at significant *P* values.

Impact of education, social circle, loneliness, marriage, and income on MM has also been stressed by other studies very often. Glynna *et al.* showed that the relationship between multimorbidity and age, gender, and free medical care eligibility, demonstrated an increased risk of having multimorbidity. However, gender had no significant effect.[39,41,48,49]

The multimorbidity prevalence for patients aged >65 years of 98% in a Canadian study might be an overestimation of true prevalence of multimorbidity, since it was done on patients attending physicians. Dekhtyar *et al.*, additionally showed association between childhood circumstances and disease accumulation speed being attenuated by later-life experiences.[49,50]

The prevalence of MM as extracted from a systematic review ranged from 4.5% to 83% in South Asia as depicted by Pati *et al.*

However, they also stressed upon the insufficient volume of work done in this arena.[13]

A significant cause of variation might be linked to ambiguity of defining multimorbidity and the data collection methods used. Following recent recommendations, which show how different methods might best be applied to research, we have used explicit definitions in order to enhance both the precision and the generalizability.[50-52]

Frailty and Polypharmacy

PP prevalence among the frail elderly was 74% and was 39.4% in the frail-prefrail spectrum. It was higher among the frails as compared to the prefrails with significant *P* values. Observational study in India by Rakesh *et al.* in 2017 estimated near similar findings (66%) and that by Gupta *et al.* in Northern India depicted PP prevalence at 58%. Although they conducted it at a tertiary care setting in contrast to the primary care setting of ours, the overall picture is more or less similar. Thus the need to inculcate a responsive attitude among healthcare professionals toward the elderly individuals so that at every follow-up visit their drug regimens are thoroughly evaluated to prevent polypharmacy becomes important. This will not only prevent the problem but also its serious sequel.[14]

A significant higher percentage of the late elderly, females, lonely, and illiterates were taking more number of medicines on a regular basis. Striking increase in polypharmacy was found among those who were nonworking (86%) as compared to the working group, and this association bore statistical significance at a *P* value of < 0.05. An Indian study by Dutta from the SAGE data showed near similar result and estimated the predictors of PP among elderly and found out the likelihood of PP to be higher in old elderly, less educated, less wealth quintile, poor self-rated health profile and among those having comorbidities. Our study findings were also similar to that of Gupta *et al.* (2018) and Mohd *et al.* (2015).[53-55]

Specific traits of elderly with PP showed that 53% and 30% often forgot medications and had mobility restrictions respectively, whereas, 16% were alone and 80% didn't have a fixed place to stay and were away from their place of origin. Not having or having few trustworthy friends heavily increased the odds of PP among the individuals, thereby rejecting null hypothesis at *P* value < 0.05. Moreover, it was found that those who had any bereavement in the past had increased odds of having PP which was statistically significant as well. Knowledge about any sort of government schemes had 1.1 increased odds of PP and those who had their own transport for availing health care had a 66% higher probability of the same at significant statistical values. All these findings call for periodic monitoring of the drug regimens as well as reviews of the prescribed drug therapy.[54,56-58]

We need to establish the cause–effect relationship better by taking up larger studies and following them up for a longer period. This was one major limitation in our study.

Conclusion

We included three specific traits of elderly, i.e. multimorbidity, polypharmacy and frailty together and assessed for its interplay and associates. Highlighting the frail–prefrail spectrum as a whole, gave us a new dimension to intervene upon, since it was found that many factors had stronger and higher association with pre-frailty rather than frailty. We recommend having the frailty checks done earlier; may be by a decade or so, and mandate it as a part of the community screening programmes as a primary care approach. Despite all approaches towards providing and doing the best with the available resources, the level of care is still primarily built around single diseases. In order to be able to improve our efficiency, we need to shift this paradigm from a vertical monomorbid approach to horizontal multimorbid one. There needs to be a structured framework which can guide us smoothly into a more individualized and simpler yet better care. The administration here has to have a pro-active role and emphasize more on team work.

Practical guidelines and assessment tools needs to be validated for different settings taking into account the feasibility and practicability.

Our study findings suggest the lone and less social individuals to be frailer, morbid, and practicing polypharmacy. With this regard, we suggest, health talks in groups for the geriatrics at the community level to hit all levels of care of health including the social component. The peer educator concept which is less explored , might do wonders for the geriatric problems. This also requires training our health manpower at all levels to be able to do a quick and rapid geriatric assessment similar to a screening, each time they visit.

When instead of repeated advise for hospital check-ups, we invest in making the patients self-sufficient at self-management and care, we end up saving valuable time, resources and convenience. For this, the use of modern technology and social networking can help us in ways or other. Self-management needs a good grade of motivation along with a familial coordination and so it becomes imperative now to counsel families on how to make homes convenient and geriatric friendly.

Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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