

Medicosocial profile of rural elderly and its covariates in Northern India – A community-based study

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Abstract

Background: India has 8.6% of its population more than 60 years with old dependency ratio of 142. Providing health services to this ever-increasing segment of society is an unenviable task.

Objective: To analyze the medicosocial profile of elderly population and its sociodemographic covariates.

Materials and Methods: A cross-sectional study on 280 subjects was conducted in a rural area of 5 villages. Every fifth elderly person was selected from all the villages after taking their consent. A predesigned, pretested, semistructured schedule was used for the purpose.

Result: About half (47.1%) of the subjects presented ≥ 1 episodes of an acute disease in the last 1 month. Maximum subjects gave history of fever (23.2%), followed by diarrhea (14.6%), backache (13.2%), and upper respiratory tract infection (12.5%). About 83.9% of geriatric population presented ≥ 1 chronic diseases (self-reported). Maximum subjects reported eye problems (53.2%) closely followed by locomotor problems (47.9%), oro-dental problems (38.6%), and respiratory problems (27.9%). The sociodemographic covariates of acute disease found to be statistically significant were increasing age, decreasing education level, illiteracy, >10 members in the family, involvement in outdoor activities, and having no decision-making power in the family whereas of chronic diseases were decreasing education levels, illiteracy, and no involvement in outdoor activities.

Conclusion: This study has identified an increasing need of nationwide efforts for facilitating the access to medical care of the elderly people in India.


KEY WORDS: Morbidity profile, elderly, sociodemographic covariates, acute disease, chronic disease

Introduction

Aging is commonly known as a process of decline in the functional ability of a person because of structural modification, with increase in age. Age-related alterations in immune

system and degenerative events make people vulnerable to several infections, neoplasia, and other disabilities. Old age is not an illness in itself, but the elderly persons are susceptible to long-term illnesses of gradual commencement such as cardiovascular illness, cerebrovascular accident, cancers, diabetes, and musculoskeletal and mental illnesses.^[1] They present multiple symptoms owing to decline in the functioning of various body functions. Expanding issues of health care, psychosocial, personal, and socioeconomic factors associated with the elderly population moreover overwhelms this.

India is an aging society with the rate of growth of aging population exceeding the growth of the general population.^[2] Population aging is the result of demographic transition with reduction in fertility leading to decline in the proportion of young in the population and at the same time there

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is increasing longevity. A report jointly brought out by United Nations Population Fund (UNFPA) and Help Age International says, "India's population is likely to increase by 60 per cent between 2000 and 2050 but the number of elders, who have attained 60 years of age, will shoot up by 360 percent and the government should start framing policies now else its consequences are likely to take it by surprise."^[3]

India has 8.6% of its population being more than 60 years (Census 2011) with old dependency ratio being 142 (Census 2011). The size of the elderly population rose in absolute terms during the last century from 12 million in 1901 to 76.5 million in 2001 and has reached 103.2 million in 2011 and is likely to reach 113 million in 2016. Providing health services to this ever-increasing segment of society is an unenviable task and requires a reliable database on health and related issues, planning, and resources. So, this study was focused on the medicosocial profile of elderly persons and its sociodemographic covariates, which we hope will help in developing health services for older persons in India.

Materials and Methods

A cross-sectional study was conducted from October 2013 to June 2014 in a rural area of Rohtak district, Haryana, India, with a view to study the health problems faced by elderly persons. CHC Chiri was chosen for the study because it is the field practice area of the Department of Community Medicine, Pt. B.D. Sharma PGIMS, Rohtak (Haryana). This area is served by 3 primary health centers (PHCs) and 20 subcenters. Of the 3 PHCs, PHC Chiri catering to a population of about 23,000 was randomly selected. All five villages under PHC Chiri were included in the study.

The subjects were selected by multistage systematic random sampling. A list of all persons more than 60 years was obtained from the auxiliary nurse midwife of each subcenter under PHC Chiri. The respective village was visited, and 20% of the total elderly population from each village was covered. For such coverage, every fifth person was randomly selected from the list obtained. All those persons not giving consent and those not available were excluded from the study. In that case, the house next to it in the list was taken up. So, 280 subjects were included for the purpose of the study. A pre-designed, pretested, semistructured schedule was used for the purpose of study after taking informed consent from every subject included in the study.

The completed schedules were checked for completeness, consistency and were coded. Data entry was done using Microsoft Excel 2013. Data were tabulated and analyzed using software SPSS (Statistical Package for the Social Sciences) for Windows version 20.0.

Categorical data were presented as percentages (%), and normally distributed data were presented as means and standard deviation. Frequency distribution tables were used to describe most of the findings, and graphs were also plotted for some. The multivariate regression analysis between acute

and chronic morbidities and each independent variable were examined by adjusted odds ratios (aOR) and 95% confidence intervals (CI). The statistical tests were performed at a 5% level of significance; thus, an association was significant if the two-tailed *p* value was less than 0.05.

Result

After following the sampling criteria as laid down in methodology, a total of 280 subjects were interviewed from the selected villages of the rural area of Haryana. Of the 280 subjects, 57.5% were male and 42.5% were female subjects as shown in Table 1. Most of them (81.1%) were in the age group of 60–75 years, with mean age being 67.35 years (± 6.894 SD). Majority of them were Jat (78.3%) by caste (upper caste). More than half of the subjects (59.6%) were illiterate, and about two-third of them (64.3%) were married. Majority of the subjects (86.1%) were residing with spouse/son. Almost half of them (44.6%) were residing in joint family, and 27.5% were living in a nuclear family. The mean family size was found to be 6.16 (± 2.813 SD) with more than half of the subjects (52.1%) having 6–10-membered family [Table 1].

As shown in Table 2, 77.1% of the subjects were decision makers in the family. Only 31.8% reported routine outdoor activity. Majority of the subjects (37.1% and 39.3%) spent 2–4 h daily with their family and local society, respectively. Only around two-third of the subjects (68.6%) were satisfied with the quality of sleep they had. Majority of the subjects (83.2%) had above average quality of diet (including 11.4% subjects having good diet). Similarly, 84.6% subjects had adequate quantity of diet (including 1.4% subjects having above adequate quantity of diet).

Regarding the morbidity in elderly persons, only 5 subjects of 280 showed signs of visible disability. About half (47.1%) of the subjects presented one or more episodes of an acute disease in the last 1 month. Among the acute diseases [Table 3], the maximum subjects gave history of fever (23.2%), followed by diarrhea (14.6%), backache (13.2%), and upper respiratory tract infection (12.5%).

About 83.9% (235) of geriatric population revealed one or other chronic diseases (self-reported), with mean number of chronic diseases in a single subject being 2.71 ± 1.109 . Maximum subjects presented eye problems (53.2%) closely followed by joint and locomotor problems (47.9%), oro-dental problems (38.6%), respiratory problems (27.9%), ear/hearing problems (17.1%), hypertension (16.1%), and diabetes mellitus (8.6%) as shown in Table 4. Other conditions found in few of the subjects were skin problems (5.4%), uro-genital problems (3.9%), history of fall in 6 months (3.6%), and social problems (1.1%).

The relationship of sociodemographic factors with presence of acute and chronic morbidities was determined by multivariate analysis. The presence of history of acute disease was significantly related to increasing age (aOR = 2.37, $p = 0.044$ for 76–85 years age group), decreasing education

Table 1: Demographic characteristics of study subjects (n=280)

Variable	Category	Male (n = 161)	Female (n = 119)	Total (n = 280)	p
Age	60–75	138 (85.7)	89 (74.8)	227 (81.1)	0.070
	76–85	17 (10.6)	22 (18.5)	39 (13.9)	
	>85	6 (3.7)	8 (6.7)	14 (5.0)	
Caste	Jats	126 (78.3)	94 (79.0)	220 (78.6)	0.000
	General caste	18 (11.2)	14 (11.8)	32 (11.4)	
	OBC	10 (6.2)	6 (5.0)	16 (5.7)	
	SC/ST/Others	7 (4.4)	5 (4.2)	12 (4.3)	
Education	Illiterate	77 (47.8)	90 (75.6)	167 (59.6)	0.000
	Primary	23 (14.3)	9 (7.6)	32 (11.4)	
	Middle	20 (12.4)	5 (4.2)	25 (8.9)	
	Matric	21 (13.0)	5 (4.2)	26 (9.3)	
	Higher secondary	15 (9.3)	7 (5.9)	22 (7.9)	
Marital status	Widow/widower	29 (18)	54 (45.4)	83 (29.6)	0.000
	Married	120 (74.5)	60 (50.4)	180 (64.3)	
	Others	12 (7.5)	5 (4.2)	17 (6.1)	
Residing with	Spouse/son	138 (85.7)	103 (86.6)	241 (86.1)	0.216
	Alone	12 (7.5)	12 (10.1)	24 (8.6)	
	Others	11 (6.8)	4 (3.4)	15 (5.4)	
Family size	1–5	66 (41.0)	52 (43.7)	118 (42.1)	0.623
	6–10	84 (52.2)	62 (52.1)	146 (52.1)	
	>10	11 (6.8)	5 (4.2)	16 (5.7)	
Family type	Joint	80 (49.7)	45 (37.8)	125 (44.6)	0.095
	Nuclear	43 (26.7)	34 (28.6)	77 (27.5)	
	Extended	38 (23.6)	40 (33.6)	78 (27.9)	

*Values in parantheses are percentages.

Table 2: Social profile of the study subjects (n = 280)

Variable	Category	Male (n = 161)	Female (n = 119)	Total (n = 280)	p
Decision maker	Yes	120 (74.5)	49 (41.2)	169 (60.4)	0.000
	No	41 (25.5)	70 (58.8)	111 (39.6)	
Outdoor activity	Yes	68 (42.2)	21 (17.6)	89 (31.8)	0.000
	No	93 (57.8)	98 (82.4)	191 (68.2)	
	<2	30 (18.6)	11 (9.2)	41 (14.6)	
Time spent with family (hours/day)	2–4	69 (42.9)	35 (29.4)	104 (37.1)	0.000
	4–6	32 (19.9)	26 (21.8)	58 (20.7)	
	>6	30 (18.6)	47 (39.5)	77 (27.5)	
Time spent with local society (hours/day)	<2	30 (18.6)	65 (54.6)	95 (33.9)	0.000
	2–4	76 (47.2)	34 (28.6)	110 (39.3)	
	4–6	37 (23.0)	13 (10.9)	50 (17.9)	
Quality of sleep	>6	18 (11.2)	7 (5.9)	25 (8.9)	0.000
	Satisfactory	124 (77.0)	68 (57.1)	192 (68.6)	
	Not satisfactory	37 (23.0)	51 (42.9)	88 (31.4)	
Quality of diet	Below average	16 (9.9)	31 (26.1)	47 (16.8)	0.000
	Average	117 (72.7)	84 (70.6)	201 (71.8)	
	Good	28 (17.4)	4 (3.4)	32 (11.4)	
Quantity of diet	Not adequate	17 (10.6)	26 (21.8)	43 (15.4)	0.010
	Adequate	140 (87.0)	93 (78.2)	233 (83.2)	
	More than adequate	4 (2.5)	0 (0)	4 (1.4)	

*Values in parantheses are percentages.

Table 3: Distribution of acute medical problems among the study subjects ($n = 280$)

Type of medical problem	Frequency (%)*
Diarrhea	41 (14.6)
Fever	65 (23.2)
Upper respiratory tract infections	35 (12.5)
Backache	37 (13.2)
Any other (urinary obstruction, anxiety, acute joint pain, etc)	13 (4.6)

*Multiple options.

level (aOR = 17.72, $p = 0.021$ for primary education) and illiteracy (aOR = 14.99, $p = 0.023$), >10 members in the family (aOR = 10.34, $p = 0.003$), involvement in outdoor activities (aOR = 7.96, $p = 0.000$), and having no decision-making power in the family (aOR = 6.88, $p = 0.000$) as shown in Table 5.

Similarly, the presence of chronic disease was significantly related to decreasing education levels (aOR = 61.17, $p = 0.002$ for primary; aOR = 78.45, $p = 0.001$ for middle) and illiteracy (aOR = 266.24, $p = 0.000$) and no involvement in outdoor activities (aOR = 24.06, $p = 0.000$) as shown in Table 6.

Table 4: Distribution of chronic medical problems among the study subjects ($n = 280$)

Condition	Frequency (%)*
Eye problem	149 (53.2)
Ear/hearing problem	48 (17.1)
Hypertension	45 (16.1)
Diabetes mellitus	24 (8.6)
Respiratory problem	78 (27.9)
Oro-dental problem	108 (38.6)
Uro-genital problem	11 (3.9)
Joint/locomotor problem	134 (47.9)
Skin problem	15 (5.4)
Social problem	3 (1.1)
H/O fall in 6 months	10 (3.6)
Other already diagnosed disease (allergy, cancer, GERD, MI, paralysis, etc)	15 (5.4)

*Multiple options.

Discussion

There is an understood presumption that illness and deterioration of ill-health are unavoidably related to chronological aging. However, physical decline in old age is not usually similar in all those in a certain age group.^[4]

Table 5: Multivariate regression analysis of sociodemographic factors with the history of acute diseases among study subjects ($n = 280$)

Factor	Acute disease in last 1 month		aOR (95% CI)	p
	Yes ($n = 132$)	No ($n = 148$)		
Age (years)				
60–75	96 (42.3)	131 (57.7)	Reference	
76–85	25 (64.1)	14 (35.9)	2.37 (1.02–5.50)	0.044
>85	11 (78.6)	3 (21.4)	3.75 (0.84–16.80)	0.084
Sex				
Male	72 (44.7)	89 (55.3)	1.28 (0.65–2.51)	0.476
Female	60 (50.4)	59 (49.6)	Reference	
Education				
Illiterate	93 (55.7)	74 (44.3)	14.99 (1.46–153.75)	0.023
Primary	16 (50)	16 (50)	17.72 (1.55–202.47)	0.021
Middle	10 (40)	15 (60)	5.40 (0.45–64.64)	0.183
Matric	8 (30.8)	18 (69.2)	3.45 (0.29–40.26)	0.323
Higher secondary	4 (18.2)	18 (81.8)	0.81 (0.06–10.66)	0.874
Graduation/above	1 (12.5)	7 (87.5)	Reference	
Family size				
>10	12 (75)	4 (25)	10.34 (2.16–49.54)	0.003
6–10	72 (49.3)	74 (50.7)	1.38 (0.76–2.51)	0.296
1–5	48 (40.7)	70 (59.3)	Reference	
Outdoor activity				
Yes	55 (61.8)	34 (38.2)	7.96 (3.58–17.67)	0.000
No	77 (40.3)	114 (59.7)	Reference	
Decision maker				
Yes	52 (30.8)	117 (69.2)	Reference	
No	80 (72.1)	31 (27.9)	6.88 (3.52–13.44)	0.000

Table 6: Multivariate regression analysis of sociodemographic factors with the history of chronic diseases among study subjects (*n* = 280)

Factor	Presence of chronic disease		aOR (95% CI)	<i>p</i>
	Yes (<i>n</i> = 132)	No (<i>n</i> = 148)		
Age (years)				
60–75	122 (50)	122 (50)	Reference	
76–85	9 (30)	21 (70)	4.71 (0.79–28.05)	0.089
>85	1 (16.7)	5 (83.3)	0.79 (0.05–12.18)	0.870
Sex				
Male	72 (44.7)	89 (55.3)	2.47 (0.76–8.06)	0.133
Female	60 (50.4)	59 (49.6)	Reference	
Education				
Illiterate	93 (55.7)	74 (44.3)	266.24 (22.92–3092.06)	0.000
Primary	16 (50)	16 (50)	61.17 (4.58–817.77)	0.002
Middle	10 (40)	15 (60)	78.45 (5.74–1072.67)	0.001
Matric	8 (30.8)	18 (69.2)	7.49 (0.72–77.53)	0.091
Higher secondary	4 (18.2)	18 (81.8)	8.09 (0.73–89.59)	0.088
Graduation/above	1 (12.5)	7 (87.5)	Reference	
Family size				
>10	12 (75)	4 (25)	3.37 (0.34–33.19)	0.297
6–10	72 (49.3)	74 (50.7)	2.32 (0.84–6.44)	0.106
1–5	48 (40.7)	70 (59.3)	Reference	
Outdoor activity				
Yes	77 (40.3)	114 (59.7)	24.06 (7.43–77.92)	0.000
No	55 (61.8)	34 (38.2)	Reference	
Decision maker				
Yes	100 (90.1)	11 (9.9)	1.06 (0.37–3.07)	
No	135 (79.9)	34 (20.1)	Reference	

This study showed that 57.5% of the subjects were male and 42.5% were female subjects. Majority of them were Jat (78.3%) by caste as the study area being dominated by this caste. Majority (75.6%) of the elderly females were illiterate when compared with male subjects (47.8%). During earlier days, educating female subjects was not considered as important as establishing marriage at early age. According to National Sample Survey 66th Round,^[5] 69.1% of the elderly population in rural area are illiterate. Most of the subjects (72.5%) lived in a joint/extended family, whereas only 27.5% subjects lived in a nuclear family with mean family size of 6.16 ± 2.81 . A similar study by Srinivasan *et al.*^[6] conducted in urban Bangaluru depicted an almost similar distribution with 63.2% subjects living in joint family.

Regarding the social profile of elderly persons, 77.1% of the subjects, mainly male subjects, were decision makers in the family. Although vast majority of older people are able to remain physically active well into older age even if they do have medical problem, many are healthy enough to undertake various forms of physical activity. But, in this study, only 31.8% of the subjects involved themselves in physical activity on regular basis. Majority of the subjects (37.1% and 39.3%) spent 2–4 h daily with their family and local society,

respectively. The lesser time spent with family or society leads to a feeling of loneliness and emptiness in life of elderly persons. Only around two-third of the subjects (68.6%) were satisfied with the quality of sleep they had. The sleeping pattern undergoes changes with aging thus leading to deprivation in quality of sleep. Dietary pattern is also of concern among the elderly persons owing to various associated morbidities. Majority of the subjects (83.2%) had above average quality of diet (including 11.4% subjects having good diet), and 84.6% subjects felt to be having adequate quantity of diet.

In line with other studies using similar methods for assessing morbidity (i.e., self-reported illness), the overall prevalence of one or more self-reported acute and chronic morbidities among elderly persons came out to be 47.1% and 83.9%, respectively. The average number of chronic morbidities per person was found out to be 2.71 ± 1.12 . Hakmaosa *et al.*^[7] showed average morbidity per person to be 2.7 in Assam which corroborates with the findings of our study. Bhatia *et al.*^[8] showed average morbidities of 2 per elderly person. Whereas, Chauhan and Chandrashekar^[9] and Joshi *et al.*^[10] showed mean morbidities per person as 3.5 and 6.9 per person in Andhra Pradesh and Chandigarh, respectively, which may be attributed to differences in study area or design.

The most common acute morbidity reported in the last 1 month was fever (23.2%), followed by diarrhea (14.6%), backache (13.2%), and upper respiratory tract infection (12.5%). Chauhan and Chandrashekar^[9] reported fever and upper respiratory tract infection in only 8.3% and 2.8% of the elderly population, respectively. Piramanayagam *et al.*^[11] reported incidence of upper respiratory tract infection in 4.4% of the elderly persons, which is lower when compared the findings of our study. Kumar and Shafee^[12] in their study in Tamil Nadu found the prevalence of backache to be 22%.

The most common chronic morbidities among elderly persons were eye problems (53.2%) such as low vision, cataract, watering eyes, glaucoma, and corneal opacity. Chauhan and Chandrashekar^[9] showed eye morbidity in 69.3% of the subjects, whereas Kumar and Shafee^[12] showed morbidity in eye and adnexa in only 39.9% subjects in their studies. Previous studies in Rohtak, Haryana^[13] and Rajasthan^[14] reported that the leading morbidity among the elderly population was visual impairment (65% and 61%, respectively). Likewise, a study in Bihar conducted by Barman *et al.*^[15] showed prevalence of cataract to 61.2% in elderly population. Eye problems in elderly persons were closely followed by joint and locomotor problems (47.9%) such as joint pain, swelling, and limitation of movements. In agreement with this finding, Subhprada,^[16] Purty *et al.*,^[17] and Bhatia *et al.*^[8] in their studies in Andhra Pradesh, Tamil Nadu, and Chandigarh showed that 44.9%, 43.4%, and 45.7% of elderly persons, respectively, showed joint pain/stiffness/musculoskeletal morbidity.

Respiratory problem was found among 27.9% of elderly individuals in this study. Comparable results were found in studies done by Prakash *et al.*^[18] and Chauhan and Chandrashekar,^[9] which showed that 36% and 26.9% of elderly individuals showed respiratory morbidities, respectively. In this study, 17.1% revealed ear/hearing problems. Similar findings were reported by Kant *et al.*^[19] with 14% and Chauhan and Chandrashekar^[9] with 14.5% of the elderly persons with auditory disability.

In our study, 16.1% of the elderly individuals reported to present hypertension. Similar prevalence (15.5%) was found in the study conducted by Kumar and Shafee^[12] in Tamil Nadu. In the joint ICMR/WHO initiative study^[20] at the urban slums of Faridabad, the prevalence of hypertension was 17.2% in men and 15.8% in women. In a study in rural Varanasi,^[21] the overall prevalence of hypertension was found to be 11.25%. Studies by Swami *et al.*^[22] and Vishnoi *et al.*^[14] showed that 58% and 25% of the elderly individuals showed hypertension, which is higher than the findings of our study as these studies were conducted in urban area and higher prevalence can be attributed to the lifestyle of the elderly population in urban area.

Further, 8.6% of the elderly persons were known diabetic cases in our study. Comparable results were found in rural parts of Tamil Nadu^[17] and in Delhi,^[19] with both showing 8.1% of elderly population exhibiting diabetes. In a study in rural Assam,^[7] the overall prevalence of diabetes was found to be 6.9%. In this study, skin problems were found among 5.4%

of the elderly population. Kumar and Shafee^[12] and Chauhan and Chandrashekar^[9] in their studies in Andhra Pradesh and Tamil Nadu showed a prevalence of skin morbidity among 19.7% and 9% of the elderly, respectively. The difference in findings can be attributed to the difference in climatic conditions prevalent in the two regions.

This study found that 3.9% of the elderly population showed uro-genital problems. Prakash *et al.*^[18] showed that 2.1% of male and 1.8% of female subjects revealed genitourinary morbidity. History of fall was found in 3.6% of the study subjects. Chauhan and Chandrashekar^[9] observed that 2.8% showed history of trauma without fracture, and 3.8% had fracture in the past.

On multivariate analysis for finding covariance between presence of morbidity and various independent variables, statistically significant association was found between presence of history of acute disease and increasing age (aOR = 2.37, $p = 0.044$ for 76–85 years age group). Acute diseases were about 15 times more prevalent in illiterates. They were also 10.34 times more prevalent in elderly having >10 members in their family owing to lesser attention, distribution of resources, and overcrowding in such families of low resource rural settings. The elderly participating in outdoor activities and having no decision power in the family were found to be about 7–8 times more prone for acquiring an acute disease.

Similarly, the presence of chronic disease was significantly related to decreasing education levels (aOR = 61.17, $p = 0.002$ for primary; aOR = 78.45, $p = 0.001$ for middle) and illiteracy (aOR = 266.24, $p = 0.000$) and no involvement in outdoor activities (aOR = 24.06, $p = 0.000$). Since physical activity enhances relaxation, relieves stress, depression, and increases mental agility along with fostering well-being which guarantee independent living and increased ability to cope until late in life, educating the community about the benefits of physical activity will go a long way in improving the quality of life.

Our study has several limitations including its cross-sectional design and the differential reporting of diseases among elderly people. We cannot exclude the possibility of reporting bias. More importantly, findings of our study should be interpreted with caution, because the observed associations from cross-sectional studies are not assumed to be causal.

Conclusion

Our findings suggest that the elderly population endure the vast majority of chronic conditions. Therefore, this study identified an increasing need of nationwide efforts for facilitating the access to medical care of the elderly people in India. This can be achieved through economic development, poverty reduction, and the establishment of effective programs in disease prevention and surveillance of geriatric health problems in the era of demographic transition in India.

Keeping in view the magnitude of health-related problems and social problems among elderly population in Haryana, it is

recommended that geriatric health services should be strengthened by creating awareness among the elderly population from time to time. Separate Geriatric outpatient department services should provide screening, curative and rehabilitative services, and convalescent homes to provide long-term care. In the medical education also, a separate subspecialty Gerontology has to be started at the earliest possible time to address the geriatric people. Community-Based Health Insurance system for elderly people has to be developed to support them financially. Social mobilization should also be promoted for considering the elders as valuable assets to the societies.

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