

### *Extended Abstract*

## **Types of Ego-centric Social Networks Among Urban Older Adults in India**

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### **Introduction:**

Population ageing is an inevitable and universal phenomenon. Owing to the decline in birth rate and increase in life expectancy worldwide and even in urban India, the elderly population is rapidly growing. In India, the percentage of the elderly population (60 years and above) increased from 5.4% in 1950 to 8.2% by 2011. Further, it is expected to increase 19%, i.e., 319 million by 2050 in India (Agarwal et al., 2020). Aging population carries huge social, economic, and health consequences, including increased out-of-pocket expenditures, the demand for social welfare reforms, and a paucity of caregivers to support the dependent elderly population (Hasan and Ghosal, 2023). This situation provoked social researchers and policymakers to understand the consequences of population ageing and to incorporate sustainable reforms to achieve healthy ageing.

Indian societies have been experiencing drastic changes in their family structures for the past few decades, which were traditionally the major source of care and support for the aged population (Gupta, 2009). For instance, the growing trend of nuclear-family setup, the huge migration of young adults from rural to urban seeking better education and jobs, and declining preferences for intergenerational co-residence are likely to expose aged persons to emotional, physical, and financial insecurity (Sonawat, 2001). As such, presence of emotionally meaningful social relations or ties may be essential to cope with the difficulties associated with later life stages (Adams, 1995; Berkman et al., 2000).

A growing body of literature supported the importance of social networks on population health and wellbeing across developed countries (Litwin, 2001; Fiori et al., 2007). Yet, less is known about these relationships in developing countries like India. Especially in urban environments, where family structures tend to be more nuclear and fragmented, migration for professions is fairly common, and social isolation is prevalent due to the fast-paced lifestyle (Ahuja, 2018). Keeping this context, an assessment of social network dynamics would enhance our understanding of the preventive measures for human health and welfare among older Indian adults.

**Objective:**

The overreaching aim of this study was to identify social network types, followed by differentials in these network types, which are studied across different demographic, economic, and socio-family backgrounds.

**Data Source and Sample:**

A cross-sectional survey design was adopted to collect the information using semi-structured questionnaire in the Kalyani Municipal Area (KMA) of West Bengal, India, during 2023. A sample of 378 older adults (both male and female) aged 60 years and above were selected from eight different wards using multistage simple-random sampling.

**Measures:**

The present study adopted the '*Convoy Model of Social Relations*' developed by Khan and Antonucci (1980) in the derivation of ego-centric social network types in context of older Indian adults. They proposed a hierarchical mapping technique in which respondents' network members were placed concentrically in three circles depending on 'subjective closeness'. After getting all network members, participants were asked a series of questions concerning the structural and relational dynamics of network members. The structural characteristics include: i) network size and ii) network composition, such as spouse, children, other family members, friends, and others. Other family members are composed of parents, siblings, other in-laws, or close relatives. The other category included neighbors, or formal helpers. The relational dynamics include: i) frequency of contact, ii) geographical proximity, and iii) emotional closeness.

In addition, this study included different demographic, economic, and socio-familial variables such as age, gender, civil status, educational attainment, working status, living arrangement, social groups, and household economic status to compare social network types with these variables.

**Statistical Analysis**

Multivariate K-means cluster analysis using eleven criterion variables were performed to identify multi-dimensional social network types that could be evolved. This technique, through Euclidian Distance (Milligan & Cooper, 1987), groups respondents with internal homogeneity and external heterogeneity. A follow-up one-way ANOVA (Analysis of Variance) was conducted to interpret and evaluate the validity of existing cluster types. Finally, the association between network types and background variables using Chi-square and Cramer's V tests for statistical significance with  $p < 0.05$  was examined. All analysis was conducted using the SPSS.29 software package.

**Results:**

The Table 2 portrays the characteristics of criterion variables to derive specific network clusters. For ease of interpretation, unstandardized scores were shown. Partially consistent with the major network typology studies, five ego-centric social networks, viz. spouse and children (living together), children (living away from parents), other family, friends, and others among the elderly sample were identified. The first three network types were predominantly family-based. The first cluster, named “spouse and children”, was composed almost entirely of participants’ spouses and children with an average of nearly three alters, and its members living in the same area and interact on a daily or weekly basis with vertical family and are emotionally close with the focal person. In the “children” network type, children made up nearly three-quarters of the group, with an average of four members (or alters). Despite having frequent interaction with vertical family members, they reported lower levels of proximity and emotional closeness. In the final family-based cluster, labeled as “other family”, extended (or distant) family members such as, siblings, sibling’s children, and close relatives, constituted the majority, with an average size of nearly five alters. Further, participants in this cluster reported high interaction within the same generations, moderate proximity, and lower emotional closeness.

The latter two clusters comprised of non-family members, termed “friend” and “other” types. Respondents in the “friend” cluster have nearly four alters, of which two-thirds were friends. Further, they reported frequent contact with non-family members, and there is some geographical dispersion and closeness. Finally, the “other” cluster is primarily dominated by neighbors, or formal helpers. On average, nearly two network members live in close proximity and engage in more frequent interactions.

The Table 3 represents the social network types by the background characteristics of respondents. The family networks comprised of young adults, who were married, had better economic status, and have been living with spouses and children. On the contrary, the non-family networks comprised of older adults who were among widowed, living alone, and dependent on others.

**Conclusion:**

Using the network assessment model, the presented network typology underscores the patterns of diversity hidden behind average network measures in different cultural milieus. Besides, allowing the identification and distribution of specific network types could lead to a better understanding of the connection between network types and population health. Furthermore,

this study also documented the importance of demographic, economic, and socio-family variables in the shape of social network types.

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## Appendix.

**Table 1.**

Means, percentages, standard deviations, and intercorrelation among eleven criterion variables (N=378).

Study variables	M or %	SD	1	2	3	4	5	6	7	8	9	10	11
1. Total network size	4.04	1.55	1.00										
2. Proportion of spouse	36.51	15.96	-.16*	1.00									
3. Proportion of child	88.36	25.62	-.01	-.24**	1.00								
4. Proportion of other family	62.70	20.85	.24**	-.22**	-.43**	1.00							
5. Proportion of friend	33.10	14.87	.02	-.09	-.33**	-.21**	1.00						
6. Proportion of others	51.85	18.44	-.13**	-.22**	-.43**	-.17**	-.04	1.00					
7. Freq.: vertical fam.	2.93	1.08	.16**	.27**	.29**	-.09	-.14**	-.41**	1.00				
8. Freq.: horizontal fam.	1.01	1.19	.30**	-.17**	-.38**	.69**	-.02	-.08	-.06	1.00			
9. Freq.: non-fam.	1.61	1.32	.26**	-.22**	-.43**	-.06	.43**	.51**	-.16**	.14**	1.00		
10. Proportion: proximate	79.16	24.33	-.25**	.22**	-.08	-.07	.02	-.03	.20**	-.11*	-.06	1.00	
11. Proportion: emotionally close	45.09	22.49	-.51**	.22**	.13**	-.25**	-.08	-.01	.01	-.28**	-.28**	.16**	1.00

Note: M=Mean; %=Percentage; SD=Standard deviation; Freq.=Frequency of contact; fam.=Family; \*\* $p<0.01$ ; \* $p<0.05$ .

**Table 2.**

Ego-centric social network types among Indians aged 60 years and above by criterion variables: K-means cluster analysis

Criterion variables	Network type					F	$\epsilon^2$
	Spouse and children N = 40 10.58% Ci	Children N = 89 23.54% Ci	Other family N = 144 38.10% Ci	Friend N = 77 20.37% Ci	Other N = 28 7.41% Ci		
Network size (M)	<b>2.78</b>	4.13	<b>4.59</b>	3.63	<b>1.92</b>	22.537***	0.186
Spouse (P)	<b>37.21</b>	3.98	7.79	5.55	<b>0.00</b>	50.452***	0.344
Children (P)	47.25	<b>72.86</b>	34.52	20.31	<b>2.56</b>	124.149***	0.566
Other family (P)	<b>8.38</b>	8.74	<b>39.63</b>	<b>8.74</b>	19.23	103.097***	0.520
Friends (P)	<b>2.48</b>	<b>4.26</b>	5.63	<b>50.16</b>	0.00	66.037***	0.408
Others (P)	<b>4.68</b>	10.16	12.44	15.24	<b>78.21</b>	84.777***	0.471
Freq.: vertical fam. (M)	<b>3.57</b>	<b>2.92</b>	2.03	1.92	<b>0.08</b>	35.604***	0.269
Freq.: horizontal fam. (M)	<b>0.16</b>	<b>0.41</b>	<b>1.79</b>	0.58	1.00	43.647***	0.312
Freq.: non-fam. (M)	<b>0.50</b>	1.19	1.45	<b>2.74</b>	<b>2.50</b>	28.940***	0.229
Geographical proximity (P)	<b>100</b>	67.12	76.96	72.07	84.62	22.289***	0.184
Emotional closeness (P)	74.46	<b>49.40</b>	35.51	59.41	<b>70.51</b>	41.629***	0.301

Note: Values in bold and italics are .5 standard deviations above and below the mean; N=Number of samples; M=Mean; P=Percentage; Ci=Cluster centroid; F=One-way ANOVA;  $\epsilon^2$ =Effect size measured by Epsilon-squared; \*\*\* $p$ <0.001.

**Table 3.**

Bivariate analysis: network types differences by background variables.

Background variables	Network types					Statistic
	Spouse and children	Children	Other family	Friend	Other	
Age						
Young-old (60 - 69 years)	59.46	45.79	48.43	56.45	38.46	$X^2(5) = 505.7^*$
Middle-old (70 - 79 years)	29.73	33.64	32.70	27.42	46.15	
Old-old (80 years and above)	10.81	20.56	18.87	16.13	15.38	
Gender						
Male	67.57	36.45	39.17	69.35	30.77	$X^2(4) = 23.79^{***}$
Female	32.43	63.55	60.83	30.65	69.23	
Civil status						
Married	83.78	33.64	55.97	70.97	15.38	$X^2(4) = 46.175^{***}$
Others	16.22	66.36	44.03	29.03	84.62	
Educational attainment						
No schooling	27.03	56.07	35.22	19.35	53.85	$X^2(16) = 45.81^{***}$
Primary completed	13.51	19.63	16.98	16.13	0.00	
Secondary completed	5.41	5.61	10.06	12.90	7.69	
Higher Secondary completed	13.51	3.74	4.40	3.23	7.69	
Graduation and above	40.54	14.95	33.33	48.39	30.77	
Working status						
Not working	25.00	13.08	19.62	16.95	16.67	$X^2(4) = 3.31$
Working	75.00	86.92	80.38	83.05	83.33	
Living arrangement						
Living alone	14.81	19.63	10.06	12.90	61.54	$X^2(16) = 66.93^{***}$
Living with spouse	23.10	10.28	22.64	25.81	7.69	

Living with a spouse and at least one child	41.01	32.71	41.51	46.77	7.69	
Living without a spouse but at least one child	16.58	34.58	19.50	11.29	7.69	
Living with others	4.50	2.80	6.29	3.23	15.38	
Social groups						
SCs/STs	40.54	54.21	49.06	41.94	46.15	$X^2(8) = 13.22$
OBCs	8.11	14.02	6.29	6.45	0.00	
Others	51.35	31.78	44.65	51.61	53.85	
Household economic status						
Dependent to others	8.11	27.10	20.75	19.35	46.15	$X^2(8) = 20.66^{**}$
Enough living expenses but unable to save	37.84	43.93	35.22	27.42	15.38	
More than required and save	54.05	28.97	44.03	53.23	38.46	

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Note: \*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$ .