Introduction: Locomotor functions decline with the age along with other physiological changes. This results in deterioration of the quality of life with decreased social and economic role in the society, as well as increased dependency, for the health care and other basic services. The demographic transition resulting in increased proportion of elderly may pose a burden to the health system. Objectives: To find the prevalence of locomotor problems among the elderly population, and related sociodemographic factors. Materials and Methods: The study was a community-based cross-sectional study done at field practice area of Rural Health Training Centre, JN Medical College, AMU, Aligarh, Uttar Pradesh, India. A sample of 225 was drawn from 1018 elderly population aged 60 years and above using systematic random sampling with probability proportionate to size. Sociodemographic characteristics were obtained using pretested and predesigned questionnaire. Locomotor problems were assessed using the criteria used by National Sample Survey Organization. Data were analyzed using SPSS version 20. Chi-square test was used to test relationship of locomotor problems with sociodemographic factors. P <0.05 was considered statistically significant. Results: The prevalence of locomotor problems among the elderly population was 25.8%. Locomotor problems were significantly associated with age, gender, and working status whereas no significant association with literacy status and marital status was observed. Conclusion: The study concluded that approximately one-fourth of the elderly population suffered from locomotor problems. The sociodemographic factors related to locomotor problems needs to be addressed properly to help them lead an independent and economically productive life.

Keywords: Elderly, locomotor problems, rural

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Therefore, the study was conducted with the objectives to find the prevalence of locomotor problem among rural elderly population, and related sociodemographic factors.

**Materials and Methods**

The study was a community-based observational cross-sectional study carried out among elderly population residing at field practice area of Rural Health Training Centre, JN Medical College, AMU, Aligarh. The study was done for 1 year from July 2013 to June 2014. It was a part of large study in which five health problems of the elderly population, namely, cataract, refractive error, locomotor problems, hearing loss, depression were taken for study. Pilot study was done to get baseline information about these health problems. The results of pilot study were not included in the final analysis.

**Sample size calculation**

Hearing loss (15%) was found to be least prevalent among the above-said problems. Thus, it was taken for the sample size calculation as shown under:

\[ n = Z^2 p (100 - p) / l^2 \]

For confidence interval = 95%, \( Z = 1.96 \)

\[ n = (1.96)^2 P (100 - p) / l^2, q = 100 - p \]

\[ n \approx 4pq/l^2 \]

\[ p = \text{Prevalence of hearing problems} = 15\% \]

\[ q = 100 - p = 85 \]

Absolute precision = 5%

Substituting the values:

\[ 204 + 10\% \text{ nonresponse} \]

\[ = 224 \approx 225 \]

Therefore, 225 elderly were included in the study from a total of 1018 elderly population using systematic random sampling with probability proportionate to size.

**Inclusion criteria**

Individuals aged 60 years and above.

Those individuals who gave consent.

**Exclusion criteria**

Individuals <60 years.

Individuals who did not give consent.

Severely ill or moribund individuals.

**Operational definitions**

**Elderly**

The World Health Organization defines older people as those individuals above the age of 60 years.[7]

**Locomotor disability**

A person with (a) loss or lack of normal ability to execute distinctive activities associated with the movement of self and objects from place to place and (b) physical deformities, other than those involving the hand or leg or both, regardless of whether the same caused loss or lack of normal movement of body – was considered as disabled with locomotor disability.[2]

The data were collected using predesigned and pretested questionnaire. Informed verbal consent was taken from each individual. The study was approved by Institutional Ethics Committee. Data analysis was done using SPSS version 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Chi-square test was used to find the relationship of locomotor problems with sociodemographic factors. \( P < 0.05 \) was considered statistically significant.

**Results**

**Sociodemographic profile of the study population**

Table 1 depicts the sociodemographic characteristics of the study population. It was observed that majority of the elderly included in the study were of age 60–69 years (61.30%) followed by 70–79 years (25.30%), 80 years and above (13.40%). The sex compositions revealed that majority of elderly were females (58.70%). As per literacy status, it was observed that the proportion of illiterates were higher (66.70%) than the literates (33.30%). Currently married were found to be in higher proportion (53.30%) as compared to the widow (46.70%)

| Socio-demographic profile | n (%) |
|---------------------------|-------|
| Age (years)               |       |
| 60-69                     | 138 (61.30) |
| 70-79                     | 57 (25.30)  |
| 80 and above              | 30 (13.40)  |
| Gender                    |       |
| Male                      | 93 (41.30)  |
| Female                    | 132 (58.70) |
| Literacy status           |       |
| Illiterate                | 150 (66.70) |
| Literate                  | 75 (33.30)  |
| Marital status            |       |
| Currently married         | 120 (53.30) |
| Widowed                   | 105 (46.70) |
| Working status            |       |
| Working                   | 114 (50.70) |
| Nonworking                | 111 (49.30) |

Table 1: Sociodemographic characteristics of the study population (n=225)
in the study population. As per the working status working elderly (50.70%) were almost equivalent to the nonworking elderly (49.30%).

**Prevalence of locomotor problems and its related sociodemographic factors**

The prevalence of locomotor problems in the study population was 25.80%. Table 2 depicts that sociodemographic factor related with the locomotor problems. It was observed that the prevalence of locomotor problems among the study population was significantly associated with age. The prevalence was highest among elderly aged 80 years and above (56.70%) followed by elderly aged 70–79 years (13.60%) and elderly aged 60–69 years (16.70%). It was observed that there was a significant association between gender and prevalence of locomotor problems. The prevalence of locomotor problems was significantly higher among elderly females (32.60%) as compared to elderly males (16.10%). It was found that the prevalence of locomotor problems was significantly associated with working status. The prevalence of locomotor problems was significantly higher in nonworking elderly (33.30%) as compared to working elderly (18.40%). It was observed that the prevalence of locomotor problems was higher in widowed (31.40%) than the currently married elderly (20.80%), but the difference was not statistically significant. It was seen that the prevalence of locomotor problems was higher in illiterate elderly (28.70%) as against the literate elderly (20%); the difference was not statistically significant.

**Discussion**

This study was a part of larger cross-sectional study conducted in rural field practice areas of Department of Community Medicine, JNMCH, AMU, Aligarh. The prevalence of locomotor problems observed in this study was 25.8% that was significantly associated with age, gender and working status; however, no significant association with marital status and literacy status was found in this study.

The other studies showed higher prevalence than the present study such as the study done in Rural Tamil Nadu showed that the prevalence of locomotor problems were 39.30% in the elderly population.[9] In a study conducted in Rural Andhra Pradesh, it was observed that 39.42% of the elderly population had locomotive disorders.[9] A study carried out in New Delhi revealed that the prevalence of locomotor disability were 39% in the study population.[10] The prevalence of locomotor problems was reported to be 32% in a study done in Bagalkot.[11] A study carried out in an urban slum of Central India revealed that the prevalence of locomotor system problems in the study population was 47.75%.[12] In a study done in the urban area of Gujarat, the prevalence of locomotor problem was reported to be 48.60% among the elderly population[13] A study carried out in rural Varanasi showed that the prevalence of locomotor problems in the elderly population was 57.80%.[14] A large scale sample survey reported that 63.70% elderly suffered from locomotor disability.[5]

The study done by some researchers showed lesser prevalence than the present study such as the study done in rural part of South India observed that the prevalence of locomotor disability was 7.50%.[15] A survey done by NSSO showed that 15% of the elderly population in rural Uttar Pradesh suffered from locomotor disability.[5] A study conducted in an urban slum of Mumbai revealed that the prevalence of locomotor disability was 15.23% among the study population.[10] In a study done in Malaysia, the prevalence of locomotor disability was found to be 20.20%.[16] A study carried out in Rural Mau showed that the prevalence of locomotor disability was 2.78% among the elderly population.[10] The prevalence of locomotor disability was reported to be 4.80% among study population in study done in New Delhi.[8]

The present study showed that prevalence of locomotor problems was significantly related with age. Similarly, the study done by Odding et al. showed that locomotor disability was significantly related with age.[9]

The current study highlighted that elderly females had significantly higher prevalence of locomotor problems as compared to elderly males. Similar findings were reported by other studies such as study done by Odding et al. revealed that locomotor disability was significantly higher among elderly females than the elderly males.[9] A study done in Rural Tamil Nadu showed that the prevalence of locomotor problems was significantly higher in elderly females as compared to elderly males.[9] In a study done in rural Tamil Nadu, it was observed that elderly females had a higher prevalence of locomotor disability as than elderly males.[9] However, other studies showed a different result than the present study such as the study done in the urban area of Gujarat the prevalence of locomotor problem was not significantly related

| Sociodemographic factors | Locomotor problems, n (%) | Chi-square test, df | P |
|--------------------------|---------------------------|---------------------|---|
| Age (years)              |                           |                     |   |
| 60-69                    | 23 (16.70)                | 115 (83.30)         | 21.951, 2 | <0.001 |
| 70-79                    | 18 (13.60)                | 39 (68.40)          |               |
| 80 and above             | 17 (56.70)                | 13 (43.30)          |               |
| Gender                   |                           |                     |   |
| Males                    | 15 (16.10)                | 78 (83.90)          | 7.714, 1 | 0.005 |
| Females                  | 43 (32.60)                | 89 (67.40)          |               |
| Working status           |                           |                     |   |
| Working                  | 21 (18.40)                | 93 (81.60)          | 6.537, 1 | 0.011 |
| Nonworking               | 37 (33.30)                | 74 (66.70)          |               |
| Marital status           |                           |                     |   |
| Currently married        | 25 (20.80)                | 95 (79.20)          | 3.286, 1 | 0.070 |
| Widowed                  | 33 (31.40)                | 72 (68.60)          |               |
| Literacy status          |                           |                     |   |
| Illiterate               | 43 (28.70)                | 107 (71.30)         | 1.963, 1 | 0.161 |
| Literate                 | 15 (20.00)                | 60 (80.00)          |               |

The present study showed that prevalence of locomotor problems was significantly related with age. Similarly, the study done by Odding et al. showed that locomotor disability was significantly related with age.[9]
to gender.[13] A study carried out in rural Mau showed that the prevalence of locomotor disability was significantly higher in elderly males as compared to elderly males.[18]

**Conclusion**

The study revealed that around one-fourth of the elderly population in rural area was suffering from locomotor problems that were significantly associated with age, gender, and working status. Therefore, rehabilitation services, as well as a screening of the elderly to detect locomotor problems, should be carried out to provide early intervention, to improve the quality of life of the vulnerable elderly population.

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**Conflicts of interest**

There are no conflicts of interest.

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