



# Prevalence of eczema among older persons: A population-based cross-sectional study

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## Abstract

**Background:** There are very few population-based studies on the prevalence of eczema among older persons

**Aims:** To estimate the prevalence and types of eczema in those aged 65 years or more in the community and to evaluate the effectiveness of community-based interventions for case finding.

**Methods:** In the first stage of this cross-sectional survey, trained health workers of a non-governmental organization surveyed the eligible population and identified persons likely to have eczema. In the second stage, dermatologists examined such persons to ascertain the diagnosis. Statistical analysis was done using Epi Info software version 7. Prevalence of eczema was expressed in percentages. Chi-square test was used for comparing the difference in prevalence of eczema in various age groups and sex.

**Results:** Health workers identified 98 persons as possible cases of eczema after interviewing 385 older persons in the community. Among them 95 persons were examined by dermatologists and 44 were confirmed to have eczema (diagnostic accuracy of health workers = 46.3%). Point prevalence of eczema was 11.4% (44/385). Prevalence was similar in males and females. It was greater (18.2 %) among persons aged 81 years or more. Asteatotic eczema, gravitational eczema and lichen simplex chronicus were the more common types of eczema. Limitations: Possible underestimation of the prevalence rates due to limited medical knowledge of health workers; limited facilities for examination and investigations at the medical camps and home visits.

**Conclusion:** There appears to be a considerable burden of eczema among older persons in the community. A community-based approach involving non-governmental organizations has the potential to identify cases and offer care close to their homes.

**Key words:** Community-based, prevalence, eczema, older persons, elderly

## Plain language summary

Eczema is a group of skin diseases presenting with itching, redness, oozing, blisters and skin thickening. Eczema can result from several genetic, environmental, lifestyle and social factors. General health problems, chronic illness, medications and physical limitations are some of the common triggers of eczema. Environmental factors like seasonal changes, low humidity, overuse of soaps and detergents can exacerbate eczema. Skin diseases like eczema is a common, current and relevant challenge among elderly subjects which can affect their quality of life. Authors conducted a study among older persons aged 65 years and above in the Puthurkkara division in Thrissur Municipal Corporation to know how common is eczema among the elderly residing there. The study was conducted with the help of health workers available from that community. The health workers first identified 98 suspected older persons with eczema and brought them to the camps, where they were examined by dermatologists, and 44 among them were identified to have eczema. In this study, the authors found that there is a high burden of eczema in older persons.

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## Introduction

Eczema is a relatively common cause of morbidity among the older population. It decreases the quality of life of affected persons and increases the cost of medical care. Most studies on the subject have been in hospital settings.<sup>1-8</sup> Though there are some population-based studies on the prevalence of eczema,<sup>9-15</sup> only a few of them are among older persons.<sup>13-15</sup>

The World Health Organization (WHO) has identified the empowerment of people and communities as one of the overarching principles and approaches in its global action plan for the prevention and control of non-communicable diseases.<sup>16</sup> This is particularly relevant in resource-poor settings. Community-based interventions have been identified to be useful in addressing chronic non-communicable diseases.<sup>17-19</sup> Such interventions are of greater value among older patients who face several barriers to healthcare access.<sup>20</sup> Community-centered interventions for the care of eczema are rare. We undertook such a project to diagnose and manage eczema among older persons. This paper aims to estimate the prevalence and types of eczema identified during this project. We shall also discuss some of the strengths and limitations of such community-centered approaches.

## Methods

This study was done as part of a community-based project of the Department of Dermatology and Venereology of the Government Medical College, Thrissur, Kerala. It had the approval of the institutional ethical committee.

### Study population

Persons aged 65 years or more, who reside in Puthurkkara division of the Thrissur Municipal Corporation.

### Inclusion criteria

Permanent residents or those residing in the division for more than one year.

### Exclusion criteria

Those who did not consent to inclusion.

### Study period

Eighteen months- from January 2018 to June 2019.

### Sample size

The sample size ( $n$ ) was calculated based on a prevalence of 12.8% for eczema among the elderly reported in a recent study in the same district.<sup>21</sup>

$n = 4pq/d^2$  in which  $p$ (prevalence percentage)=12.8,  $q$ (100-prevalence)= 87.2; and  $d$ (absolute precision)= 5. Expecting a non-response rate of 20%, the required sample size was 224.

### Sampling method

Being a community-centered health project, the entire eligible population in the defined geographic area (estimated to be 401 based on the updated voters list) was planned to be covered.

## Study procedure

The study was done with the support of Prathyasa, a non governmental organization which is involved in providing care for the elderly in the area under the Thrissur Municipal Corporation.

The trust employed two female health workers (one who had completed matriculation and the other with a bachelor of arts degree) for their community health outreach activities and day care centre for the elderly. We conducted a training session of 2-h duration for these workers regarding the common presentations of eczema with the help of clinical photographs. We instructed them to suspect eczema if any of the following features were present: itching, redness, oozing, scaling, crusting or thickening of the skin.

The health workers visited the homes of the elderly in the region and explained the purpose of the project. Those who were not willing to give written informed consent were excluded. The health workers asked a set of pre-drafted questions in their proforma about the presence of features suggestive of eczema to the participants and identified possible eczema cases based on the responses. They were not instructed to examine the persons in detail, nor to examine the entire body. Older persons with any of the features of eczema were invited to attend camps at the day care centre for older persons run by the non governmental organization on appointed days to seek confirmation and treatment by consultant dermatologists. Arrangements for travel to the centre were provided to the patients who needed it. One faculty member with a post-graduate qualification in dermatology and more than eight years' experience and one post-graduate resident attended the camps. Home visits were conducted to examine bedridden patients and those who failed to attend the monthly camps for various reasons. The same investigators carried out monthly camps and home visits. The consultants saw all suspected cases of eczema. The diagnosis of eczema was confirmed or excluded by the investigators during the camps and home visits by direct patient interview and examination. Those who needed follow-up care were provided the same every month. Evaluation of the project was done at the end of 18 months, using the following outcome measures: A) number of persons identified by health workers to have had possible features of eczema, B) the number of persons who were confirmed as having eczema by consultants and C) clinical types of eczema. The results were analyzed using descriptive statistics.

## Statistical analysis

Statistical analysis was done using EpiInfo software version 7. The prevalence of eczema and other categorical variables were expressed as percentages. Chi-square test was used for comparing the prevalence of eczema in various age and sex groups.

## Results

The estimated total population of Puthurkkara (division 55) of Thrissur Municipal Corporation was 5250, according to the voters' list updated in May 2016. Among them, 401 (7.6%) were aged 65 years or more. Sixteen persons could

**Table 1: Flow of population through the study**

Characteristics of the population	Number of persons
The total population of the municipal corporation division	5250
Persons above 65 years of age according to the voters' list	401
Persons 65 years or older seen by health workers	385
Persons suspected to have eczema by health workers	98
Persons seen by dermatologists	95
Persons diagnosed to have eczema by dermatologists	44

**Table 2: Age distribution of older persons seen by the dermatologists**

Age	Number of persons with eczema (%)	Number of persons without eczema (%)	Total, n (%)
65–70 years	28 (13.1)	185 (86.9)	213 (100)
71–80 years	8 (16.3)	120 (93.7)	128 (100)
81 years and above	8 (18.2)	36 (81.8)	44 (100)
Total	44 (11.4)	341 (88.6)	385 (100)

Pearson  $\chi^2$ : 5.994 with 2 degrees of freedom; *P*: 0.05

**Table 3: Sex distribution of older persons seen by the dermatologists**

Gender	Number of persons with eczema (%)	Number of persons without eczema (%)	Total, n (%)
Male	21 (11.2)	167 (88.8)	188
Female	23 (11.7)	174 (88.3)	197
Total	44 (11.4)	341 (88.6)	385

**Table 4: Clinical types of eczema among older persons**

Clinical type of eczema	Number of affected persons (%)
Asteatotic eczema	12 (3.1)
Gravitational eczema	10 (2.6)
Lichen simplex chronicus	9 (2.3)
Allergic contact dermatitis	6 (1.6)
Atopic dermatitis	4 (1)
Nummular/discoid eczema	4 (1)
Seborrhoeic dermatitis	2 (0.5)
Irritant contact dermatitis	2 (0.5)
Hand eczema	1 (0.26)
Infective eczema	1 (0.26)

Several patients had more than one type of eczema

not be evaluated because eleven persons were not present in their homes during the visits and five were not willing. Of the 385 elderly persons who could be evaluated, 98 were identified to have possible eczema by the health workers. Consultants examined 95 persons among them at monthly camps or during house visits. Eczema was confirmed in 44 among them [Table 1]. There was a time delay of less than a week between the initial home visit by health workers and the consultants' examination in camps. The prevalence of eczema thus estimated was 11.4% (44/385). The diagnostic accuracy (precision) of the health workers was 46.3% (44/95). Majority of the subjects (26 patients; 59%) were on some treatment

**Table 5: Other skin diseases detected among older persons during the survey**

Other skin diseases	Number of persons affected (%)
Psoriasis vulgaris	12 (3.1)
Tinea corporis	5 (1.3)
Miliaria	5 (1.3)
Xerosis	4 (1)
Seborrhoeic keratosis/dermatosis papulose nigra	5 (1.3)
Macular amyloidosis	4 (1)
Intertrigo of feet	4 (1)
Melasma	3 (0.8)
Postinflammatory hyperpigmentation	2 (0.5)
Other diseases*	9 (2.3)

\*Other diseases included one case each of pedal edema, polymorphous light eruption, vitiligo, tinea versicolor, lichen planus, corn on foot, cellulitis of leg, verruca vulgaris and lymphoedema

modality at the time of the study. The systems of medicine chosen by the subjects were modern medicine (*n*= 18; 40.9%), Ayurveda (*n*=9; 20.5%) and homeopathy (*n*=3; 6.8%).

Age and sex distribution of the elderly persons are given in Tables 2 and 3 respectively. The prevalence of eczema was 18.2% among persons aged 81 years or more, 13.1% among those aged 66–70 years and 6.3% in the 71–80 year age group ( $\chi^2= 5.994$  with two degrees of freedom; *P*= 0.05). Prevalence among females was 11.7% and among males, 11.2% ( $\chi^2=0.024$ ; *P*= 0.44). Pruritus was the commonest symptom in the study subjects, reported by 100 % (44) of persons with eczema. Twenty two (50 %) persons had scaling, 14 (31.8%) had oozing, 13 (29.5%) had dryness and eight (18.2%) had thickening of the skin lesions.

Asteatotic eczema (*n*=12) was the commonest type of eczema [Table 4]. Among other skin diseases suspected by the health workers to be eczema, but diagnosed as not eczema by the consultants, the most common disease was psoriasis vulgaris(*n*=12) [Table 5].

Among patients with eczema, hypertension (*n*=14; 31.8%) was the commonest comorbidity seen followed by diabetes mellitus(*n*=9; 20.5%), dyslipidemia (*n*=5; 11.3%), coronary artery disease (*n*=3; 6%) and bronchial asthma (*n*=2; 4.5%). One patient (2.3%) each had thyroid disease and a history of carcinoma lung. Three patients with asteatotic eczema were on treatment with statins for dyslipidemia and coronary artery disease. None had chronic liver disease or renal disease.

### Discussion

We found that it is possible to find several cases of eczema among older persons using a community-based case-finding approach. Health workers even without medical qualifications can be effectively trained and utilized to identify possible cases. Our results indicate that there is a considerable burden of eczema among older persons in the community.

The prevalence of eczema dermatitis among the elderly in this study (11.4%) is probably an under estimate. Health workers might have missed some patients with eczema during their screening due to reasons such as the inability of the elderly

**Table 6: Prevalence of eczema in various population-based studies**

Authors	Year of publication	Country	The age group of population (years)	Type of ascertainment of diagnosis	Sample of the population studied	Prevalence (%)
Hanifin <i>et al.</i> <sup>9</sup>	2007	United States	General population	Self-administered questionnaire	116,202	10.7 (past 12 months)
Rönmark <i>et al.</i> <sup>10</sup>	2012	Sweden	16–75	Self-administered questionnaire	18,087	11.5 (current eczema)
Silverberg and Hanifin <sup>11</sup>	2013	United States	18–85	Questionnaire administered by trained interviewers	27,157	10.2 (1-year prevalence)
Garg and Silverberg <sup>12</sup>	2015	United States	18–85	Questionnaire administered by trained interviewers	34,500	7.2 (past 12 months)
Cybulski and Krajewska-Kulak <sup>13</sup>	2015	Poland	Above 60	Self-administered questionnaire	200	6.5
Caretti <i>et al.</i> <sup>14</sup>	2015	African Americans	60–91	A self-administered questionnaire, under the supervision of the investigator	101	28.7
Sanders <i>et al.</i> <sup>15</sup>	2017	Netherlands	Above 50	Examination by dermatology-trained physicians	5365	7.7 (in addition to 13.3% prevalence of seborrhoeic dermatitis)
Asokan and Binesh <sup>21</sup>	2017	India	65 years and above	Direct examination by dermatologists	562	12.8
Present study	2019	India	65 years and above	Questionnaire survey administered by trained interviewers followed by confirmation by direct examination by dermatologists	385	11.4

persons or health workers to recognize the features of eczema, the reluctance of the persons to reveal their disease to health workers and other factors limiting the communication between them.

The prevalence of eczema or dermatitis among elderly persons reported in various hospital-based studies ranges from 11.9% to 58.7%.<sup>1-8</sup> Such studies are subject to considerable selection bias and cannot be considered to provide a true reflection of the prevalence of the disease in the community. Hanifin *et al.* found that the prevalence of “empirical eczema,” defined as itching /scratching and red/ inflamed rash or excessive dryness /scaling, was 10.7% among 116,202 individuals among the general population in the United States.<sup>9</sup> Rönmark *et al.* reported a prevalence of 11.5% in the 16–75 age group in Sweden.<sup>10</sup> Silver berg and Hanif in reported a prevalence of 10.2% among adults aged between 18 and 85 years in the United States.<sup>11</sup> Garg and Silverberg reported a prevalence of 7.2% among the same age group.<sup>12</sup>

Among the population-based studies limited to older persons, Cybulski and Krajewska-Kulak reported a comparatively low prevalence of 6.5% among 200 persons aged more than 60 years<sup>13</sup> [Table 6]. A study among 101 African Americans in the United States reported a comparatively high prevalence of 28.7% in the 60–91 age group.<sup>14</sup> Sander *et al.* reported a prevalence of 7.7% of eczema (excluding seborrhoeic dermatitis) among patients older than 50 years in Rotterdam, Netherlands.<sup>15</sup> The same study reported a 13.3% prevalence of seborrhoeic dermatitis.

An earlier study among elderly persons in the same district reported an overall prevalence of 12.8% for eczema (11.1% among diabetics and 14.5% among non diabetics).<sup>21</sup> Our figures are slightly lower. The lower prevalence in this study could be explained by a two-stage method of identification of cases, in contrast to the direct evaluation of all participants by specialists in the previous study.

There is no universally accepted cut off for old age. Most developed countries consider persons above 65 years as elderly. We also used 65 years as the cut off age as Kerala has a comparatively high life expectancy at birth (above 75 years), comparable with that of several developed countries.

Health workers who performed the preliminary evaluation of older persons in this study received only brief training to identify suspected cases. Despite this, they picked up a sizable number of possible eczema cases of which nearly one half were subsequently confirmed by specialists. The diagnostic accuracy of the health workers (46.3%) was quite high, though we were unable to find previous studies using this methodology for comparison. Case finding using health workers who can form a link between consultants in a tertiary care hospital and needy persons in the community has several positive implications from the perspective of public health. It can improve access of needy individuals persons in the community to tertiary level care. It is particularly relevant among older persons who have several barriers—physical and social—to accessing care. The provision of sustained care as close to the homes of older persons can reduce the cost of healthcare. By making the care available regularly, it has the potential to improve adherence and increase the effectiveness of treatment.

We found that asteatotic eczema was the most common type of eczema among older persons. This is consistent with previous reports.<sup>1</sup> The increasing tendency of the skin of older persons to become xerotic is an obvious cause. A high prevalence of lichen simplex chronicus can be considered as a pointer to psychological distress in old age. Loneliness and depression are more common among older persons.<sup>22</sup> Similarly, venous stasis which is usually irreversible and more common in old age could lead to a high prevalence of gravitational eczema. Though

allergic contact dermatitis was seen in six patients, other types of exogenous eczema such as irritant contact dermatitis, infective eczema and photo dermatitis were less frequent, probably due to a limitation of physical activity in old age, decreasing chances of exposure to external causative factors.

The figures we obtained for other non eczematous dermatological conditions also are likely to be underestimates. They only provide an estimate of conditions considered by some older persons or the health workers to possibly be eczema and subsequently not found so by consultants; this would explain the limited number of persons with those other diseases identified in this study. Despite this, we could diagnose twelve patients (3.1%) with psoriasis. Probably, psoriasis was picked up in greater numbers by health workers because it has several common features (itching, redness, thickening, scaling) with eczema which can easily confuse medically unqualified persons.

There are some limitations to this study. One is the possibility of errors and misdiagnosis during the screening by health workers who were not medically qualified. Any errors in the voters' list or any changes occurred in the study population after the voters' list was last updated is another possible limitation of the study. This was partly overcome by including those who turned 65 years during the course of the study. Another limitation would be the limited facilities for examination and investigations at the peripheral camps and home visits. The diagnosis of allergic contact dermatitis for instance was done without patch testing. But the expectedly higher diagnostic accuracy of experienced specialists ensures that the rates we obtained are probably under estimates rather than over estimates and underline a high burden of eczema in elders in the community. A population-based design, adequate sample size, coverage of 96% of the eligible population and confirmation of diagnosis by experienced dermatologists are important strengths of the study. Most of the previous population-based studies had resorted to questionnaires to be answered by patients themselves to elicit information [Table 6]. Sanders *et al.* used physicians trained in dermatology for diagnosis, whereas Asokan and Binesh employed direct examination by dermatologists.<sup>15,21</sup> It can be expected that diagnoses made by dermatologists are more accurate than questionnaires answered by patients themselves.

There is considerable scope for community-centred interventions to identify needy individuals in the community and offer them sustained care. In addition to providing some pointers to the burden of eczema among older persons, our findings indicate that community-centred interventions can improve access to care of older persons with eczema cost-effectively.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Prathyasa Trust, a nongovernmental organization in Thrissur, Kerala provided health workers and arranged medical camps.

#### Conflicts of interest

There are no conflicts of interest.

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