

# Burden, Pattern, Associated Factors and Impact on Quality of Life of Dermatological Disorders Among the Elderly in Ilala Municipality, Dar Es Salaam: A Cross-Sectional Study

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## Abstract:-

### ➤ Background

The global population of people aged 60years or older (elderly) is increasing. Skin disorders are reported to be common in this population. In view of limited data available, this study determined the burden, pattern and impact on quality of life (QoL) of the disorders among the elderly in Tanzania.

### ➤ Methodology

This was a community-based cross-sectional study conducted from August to November 2021 in Ilala Municipality, Dar es Salaam. Participants were obtained through simple random sampling in multiple stages. Diagnoses were made through clinical assessment initially performed by the Principal Investigator and a dedicated Dermato-venereology Officer, and then confirmed by a Dermatologist using digital photographs. Quality of Life was assessed using a validated Dermatology Quality of Life Index (DLQI) with scores ranging from 1 to 30. The wealth index was graded from class 1 (poor) to class 5 (rich).Data were analyzed through Chi-squared test, Poisson Logistic regression, and analysis of variance.

### ➤ Results

A total of 694 elderlies were enrolled. The overall prevalence of dermatological disorders was 593 (85.45%). The commonest disorders were skin infections and infestations (36.1%); eczemas (34.7%); papulosquamous eruptions (6.5%), and keratinization disorders (2.6%).Autoimmune disorders comprised 1.4%, while vascular disorders and tumors were less prominent, comprising of 1.2% of all cases. A small proportion (1.7%) of the elderlies had  $\geq 2$  skin disorders. In multivariate analysis the wealth index was found to be associated with the presence of the disorders. There was 61% impairment in QoL due to the dermatological disorders.

### ➤ Conclusion

Dermatological disorders among the elderly were common and were associated with the wealth index. They had a significant impact on quality of life. Appropriate control measures to address dermatological disorders among the elderly are needed.

**Keywords:-** Quality of Life, Dermatology Quality of Life Index.

## I. INTRODUCTION

Dermatological disorders are a common occurrence in the community and are a major disease category in hospitals. Due to numerous ecological, ethnic, economic, and social factors, dermatological disorder trends varies by country and by region within a country(1). The demographic profile of a country is also known to affect the burden and pattern of dermatological conditions(2).

The proportion of the geriatric population has been growing in Tanzania, similar to what is happening in other developed and developing countries(3).Tanzania's population of adults aged 60 and more is on the rise. The UN estimates show that by 2050 this proportion of the elderly is predicted to double to around 11 %(4).The aging process is expected to have a significant effect on health, quality of life, and physical capabilities in this scenario.

In the elderly population, several factors influence development and presence of dermatological disorders, ranging from co-morbid medical illnesses and medications used to treat them to social-economic factors and the environment(5).Furthermore, as people age, their skin undergoes both intrinsically and extrinsically changes, leaving them more vulnerable. For instance, it is known there is a reduction in physiological reserves during ageing, which raises the risk of progressive blood vessel atrophy, degradation of the supportive dermis, and collagen and elastin fibre disorders (6).

Patients' satisfaction with their lives has long been considered to be negatively impacted by dermatological disorders. The psychosocial nature of dermatological disorders has significant consequences for patient care. Even though Dermatologists and other Physicians have long recognized the effect of dermatological disorders on a patient's life, life quality metrics has only recently been used as assessment criteria in treating chronic skin disorders and evaluating new treatments(7).

Despite their common occurrence in the older population, epidemiological studies detailing dermatological disorders among the elderly are few. Much of the available data is obtained from selected elderly population, such as nursing home patients or those seen in tertiary care settings. In the general population, studies are uncommon (4).

#### ➤ Objectives

This study aimed to determine prevalence, pattern, associated factors and impact on quality of life of dermatological disorders among the elderly in Ilala Municipality, Dar es Salaam.

## II. METHODOLOGY

#### ➤ Study Design

This was community-based cross-sectional study.

#### ➤ Study Settings

The study was conducted in Ilala Municipality in Dar es Salaam region, Tanzania between August 2021 to November 2021. All elderly people in Ilala Municipality, Dar es Salaam, who are 60 years and above and willing to participate and agree to sign informed consent were recruited into the study.

The Principal Investigator who is a Post-graduate student (Resident) in internal medicine and one Research Assistant (Dermato-venereology Officer) was trained for eight weeks in the dermatology clinic at the Muhimbili National Hospital (MNH) by Dermatologists before starting data collection.

Recruitment of study participants was carried out on a weekday, whereby the elderly were interviewed and examined in daylight while maintaining privacy. The disease was classified for ease of data recording. Diagnoses were made through clinical assessment, initially performed by both the Principal Investigator and the dedicated Dermato-venereology Officer, blessed by a detailed clinical history. A digital photograph of all skin lesions was taken for confirmation by the Dermatologist at the MNH. Participants requiring further laboratory and histological studies were informed and referred for treatment, but tests were not done as part of the study.

#### ➤ Variable

Socio-demographic such as age, gender, level of education, occupation, residence, presence of systemic disease, presence of a company at home, medication for other comorbidities and income source (wealth index class). The dependent variable was the dermatological disorder.

#### ➤ Sample Size

The sample size has been calculated by using the following formula,  $Nr = Z^2 p (1-p) / e^2$  and adjusted for non-response  $n = Nr \times 100 / (100 - f)$ , hence required sample was approximately to 694 participants. The prevalence used from this study was 7% ,from the kelvin study (5).

#### ➤ Statistical Analysis

The collected data was checked for quality, and coding was done before entering into the statistical computer program. Data were analyzed with the Statistical Package for Social Sciences (SPSS) version 23.0.

Chi-squared statistical test was used to analyze categorical data. Univariate and multivariate analyses were used to determine factors associated with the dermatologic disorder. Modified Poisson Logistic regression analysis was used to estimate crude and adjusted prevalence ratio and their 95% confidence intervals. A p-value of  $<0.05$  was considered statistically significant. In summary the analysis of DLQI determined the scores per skin disease category among the elderly. The independent variable one-way ANOVA was used to compare group differences.

#### ➤ Ethics Aspect

Ethical clearance to conduct the study was sought from the Muhimbili University of Health and Allied Sciences' Ethical Review Board. Permission to conduct the study was obtained from Ilala Municipality Council and appropriate Local Government committees.

Informed consent was obtained from all study participants before they were enrolled in the study. Individuals eligible to participate in the study were included only after being provided informed consent.

## III. RESULT

The social demographic characteristics of the participants are reported in Table 1. Out of the 694 elderly studied, 308 (44.4%) were male and 386 (55.6%) were female. The study population's median age was 65 years, with a range of 60 to 92 years, with the age group under 70 years accounting for the largest proportion 537 (77.4%). Buguruni Ward had the highest number of the elderly, being 214 (30.8%). The majority were married 492 (70.9%), while 62 (8.9%) were widowed. The majority of the elderly (283/694, 40.8%) had completed secondary school, 258 (37.2%) had completed primary school, and 100 (14.4%) had no formal education. About 230 (33.1%) of the elderly had retired from formal employment, while 39 (5.6%) were still employed. Most of the elderly (498/694, 71.8%) were living with family members, and the majority (60.7 %) were living in households with four or more people.(Table 1).

In Table 2 .A wide range of disorders were seen. The highest number of cases presented with skin infections and infestations (36.1%), followed by eczemas (34.7%), papulosquamous diseases (6.5%), and keratinization disorders (2.6%). Autoimmune disorders (1.4%), while cutaneous vascular disorder and tumors were less prominent, comprising

of 1.2% of all cases. A small proportion (1.7%) of the elderly had two or more skin disorders.

In Table 3. Summarizes results of univariate and multivariate analysis of the possible factors associated with dermatological disorder. In a multivariate analysis level, the elderly with the wealth index classes 1 (poorest), (aPR 1.13, 95% CI 1.02-1.25,  $p=0.022$ ) were independently associated with dermatological disorders.

- *Figure 1: Flow chart showing enrolment of study elderly*
- *Figure 2: The overall Prevalence of Dermatological disorders in elderly*
- *Figure 3: Levels of the effect of dermatological disorders among patients*

#### IV. DISCUSSION

In this study it was found that the prevalence of dermatological disorders among the elderly in Ilala Municipality was 85.4%. This finding was comparable to those from a cross-sectional study conducted in Northern Finland involving 552 elderly aged 70 and above whereby an overall prevalence of skin diseases was found to be 80%, and the most common dermatological conditions were fungal skin infections(9). Similarly, a previous multicenter study conducted in the federal state of Berlin, Germany among aged nursing home residents found that skin diseases were common, and almost every participant had at least one dermatological diagnosis(10). However, our findings are different from other findings reported in literature. For instance, a systematic analysis that included electronic database searches in MEDLINE, and PubMed in Australia that screened 61 reports from countries showed that the nature and prevalence of skin disease among the elderly varies widely between clinical environments. Indeed, we discovered during our literature review that the prevalence of skin problems reported by the elderly at dermatological clinics rarely exceeds 25% (11).

The observed discrepancies could be explained by the fact that our study took place during a period of significant seasonal change in the frequency of skin disease, particularly infectious disease, which is common in tropical and subtropical climate zones(12). The findings are also consistent with the earlier report that dermatological disorder trends do vary from country to country and from region to region within a country as a result of differences in ecological, ethnic, economic and social factors(1).

In our study, the most frequent disease group was skin infections and infestations (36.1%). These findings were similar to those of two other studies, which found that the most common dermatological disorders in older individuals were skin infections (38.61%) and (23.7%), respectively(13,14). However, the study conducted at a tertiary hospital in Northern Tanzania, reported that skin infections and infestations were less prevalent (11%) in elderly patients(5). This disparity in findings could be explained by the fact that the high frequencies are likely due

to the warm and highly humid climate, overcrowding, and poor personal and skin hygiene in the city(15).

This reflects a slowed healing process due to compromised immunological function, skin thinning, dryness, and decreased blood flow. Furthermore, bacterial entry into the skin is facilitated by epidermal degradation caused by itching, which is more common in the elderly (8, 26).

In our study 20.7% of people had fungal infections, 7.8% had viral infections, and 1.2% had scabies. In a research on the elderly in Benghazi-Libya dermatological clinics, the frequency of fungal and viral infections was 49.6% and 11.3%, respectively(16). In a cross-sectional study conducted in nursing homes in southern Taiwan, the fungal infection rate was 61.6% (17). The fact that the Taiwan study looked at resident of nursing facilities, whereas ours looked at a general community of elderly individuals could explain the disparity in results. The significant prevalence of dermatophytosis (13.1%) and onychomycosis (7.3%) that we found can be explained by changes in environmental conditions(18). Our findings back up previous findings that fungal skin infections are more common in the elderly (16,17).

Eczemas were the second-most-commonly observed disorders (34.7%). This contrasts with earlier data from previous studies, which showed that eczema was the most frequent skin illness in most hospital-based investigations, with rates ranging from 11.9% to 58.7%(5). The prevalence of eczematous diseases in the elderly in the community-based study reported a higher prevalence similar to our study by 28.7% among 101 African Americans in the United States(19). The disparity in prevalence could be attributed to a variety of factors, including socioeconomic class, geographical or living conditions, ethnicity, or population location(2).

The third most prevalent disorder was papulosquamous disorders, which were similar to other regions. Papulosquamous disorders are also more common than previously thought, with rates of between 4 and 11.5%. Papulosquamous disorders were the third most common disorder which is similar to other regions(20,21). Our study indicated that cutaneous vascular and tumor groups were less common, similar to prior studies in the African region(5).

In our study the wealth index class 1 (poorest) was independently associated with dermatological disorders. Similar outcomes were observed in a cross-sectional study of Finnish adults aged 70 to 93 as part of the Northern Finland Birth Cohort 1966 Study(9). In a study evaluating the prevalence of skin disorders and their relationship to socioeconomic status, researchers reported that the prevalence of skin infection was higher in low-income Asian countries(2). The burden of skin cancer in Asia was relatively low similar to our study findings. Another study showed skin disorders in the Elderly Population Attending Tertiary Care Hospital in Karachi were associated with socioeconomic status (wealth status) similar to our study (22). The similarity might be due to lower socioeconomic status playing its role in forcing people to live in small overcrowded houses, which

forms the basis of the spread of some dermatological disorders through close contact(22)(23).

It was further found that elderly with a low socioeconomic status had poorer health than those with a high socioeconomic status. These findings were similar to those from the EDEN fragrance study (EFS) conducted by the European Dermato-Epidemiology Network (EDEN) and involved five European countries (24).

In our study, systemic diseases were not associated with dermatological disorders in the elderly in a manner that was statistically not significant. However there are studies that have reported an association of dermatological disorders with specific systemic diseases like diabetes or cardiovascular conditions in the general population, but not specifically in the geriatric age group(25). Similarly, results from a prospective randomized study that involved a group of 260 consecutive patients aged 60 years in Egypt found that there was a significant correlation between the number of systemic diseases and the number of dermatological disorders observed in (21). This big difference is thought to be because of the self-report of systematic diseases in our study and the low awareness of health issues among the elderly in general(25) .

It has been found in this study that dermatological conditions have a detrimental impact on quality of life. The proportion of elderly with dermatology life quality index scores of >10 was 61.0% with the mean DLQI score (SD) being 15.1(±7.1), indicating a large effect of skin diseases on patients' quality of life (QoL).A study conducted among the elderly in the United Kingdom found that skin disease seems to have a larger impact on patient quality of life, similar to our findings (26). This might explain the inadequate social interaction, as well as poor economic and education levels among the elderly attributing to a large effect of skin disorders on patients' quality of life (QoL)(27).

Keratinization disorders, autoimmune disorders and papulosquamous disorders were associated with high mean DLQI scores. This is most likely related to the highly symptomatic nature of such conditions(28). As reported in another study the majority of elderly had severe illnesses associated with higher symptomatic impairment on quality of life(29). This might explain the high proportion of elderly with high DLQI scores and sleep disturbance as compared to outpatients.

In this study, there was no significant difference between the quality of life scores of males versus those of females regarding dermatological disorders. This was similar to findings of a study done in the U.K involving patients aged 65 and over aiming to assess quality of life and determine the type and extent of skin disease(26).In line with some worldwide research, which found that gender had no impact on quality of life (30).However, gender disparities were not constant across all research. These variations could be attributable to differences in populations, sample methodologies, study sites, and the diseases studied(31).The limitation of this study is Complete dermatological examination and diagnosis of most conditions were made by

the Principal investigator, an internal medicine resident and one Research Assistant (Dermato-venereology Officer). The Independent Dermatologist (Supervisor) reviewed all the photographs of the skin lesions taken from participants to confirm a diagnosis as Strategies to reduce the anticipated biases and limitations.

## V. CONCLUSION

This study has shown that dermatological disorders among the elderly were common, and that the commonest were of infectious origin. Wealth index was directly correlated with the presence of such dermatoses. Furthermore, the diseases had a significant impact on the quality of life of the elderly.

### ➤ *Recommendations*

Based on the findings of this study, we recommend the following:

Our national management guidelines need to be inclusive of appropriate strategies to diagnose and control dermatological disorders among the elderly. Health care workers will also need to be properly oriented on the burden, pattern and effect of dermatological conditions among the elderly.

It will be useful to include a component of assessment of Dermatological Quality of Life when managing elderly patients with skin diseases.

Further studies are needed to determine the fundamental causes of the current disease spectrum and to expand the understanding of dermatological disorders in the elderly in the community.

### ➤ *Competing interest*

We declare no conflict of interest

### ➤ *Authors' contributions*

All authors have contributed to this manuscript in ways that comply with ICMJE authorship criteria. All the authors have read and approved the final version of the manuscript.

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ANNEX

- Table and figure
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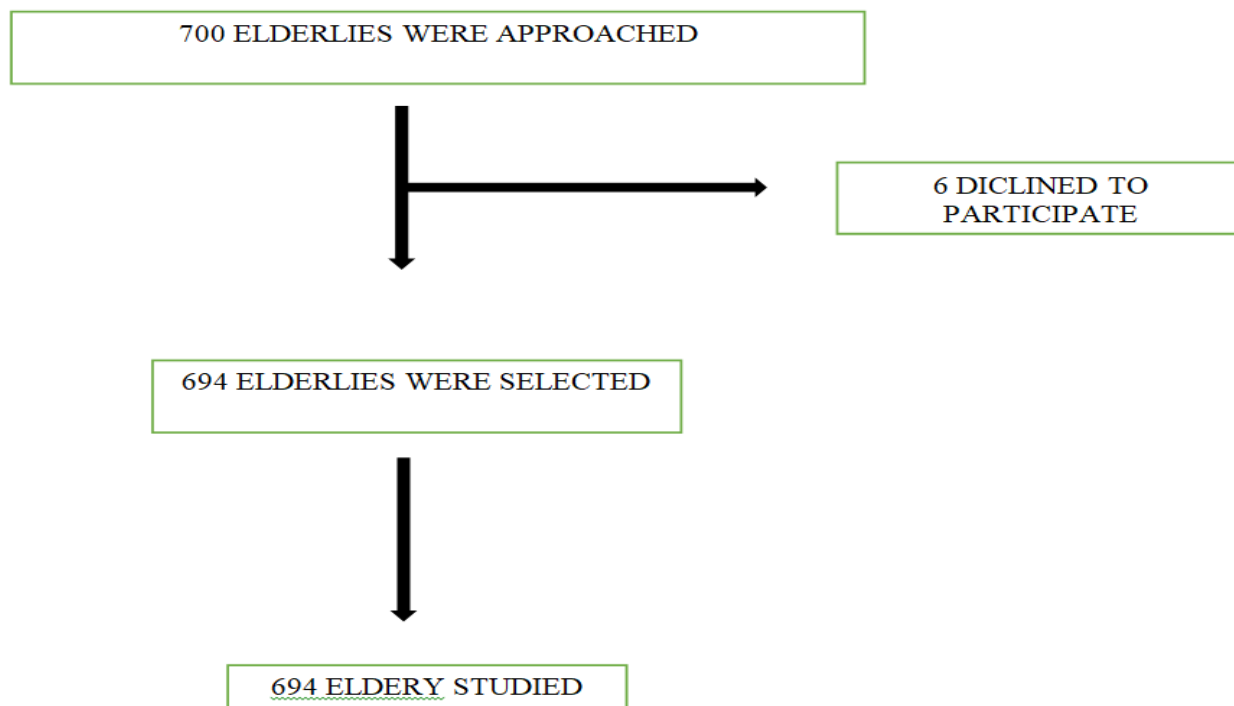


Fig 1 Flow Chart Showing Enrolment of Study Elderly

Table 1 Socio-Demographic Characteristics of the Study Participants, N=694

Variable	Frequency (n)	Percent (%)
Age group (year)		
≤ 70	537	77.4
>70	157	22.6
The median age in the year (Range)	65 (60, 92)	
Sex		
Male	308	44.4
Female	386	55.6
Wards		
Upanga West	43	6.2
Upanga East	33	4.8
Ilala	94	13.5
Buguruni	214	30.8
Kinyerezi	116	16.7
Kivukoni /Kigamboni	20	2.9
Kitunda	174	25.1
Marital status		
Single	44	6.3
Married	492	70.9
Divorced	60	8.6
Separated	36	5.2
Widow	62	8.9
Education level		

	No formal education	100	14.4
	Primary education	258	37.2
	Secondary education	283	40.8
	College /University	53	7.6
<b>Occupation</b>			
	Retired	230	33.1
	Employed	39	5.6
	Self employed	200	28.8
	Unemployed	225	32.4
<b>Family size</b>			
	1	25	3.6
	2	65	9.4
	3	183	26.4
	≥ 4	421	60.7
<b>Living status</b>			
	Living alone	196	28.2
	Living with a spouse or family members	498	71.8

Table 2 Distribution of Dermatological Disorders of the Study Participants, N=694

<b>Dermatological disorders</b>		<b>Frequency (n)</b>	<b>Percent (%)</b>
<b>I. Infection and infestation</b>		<b>252</b>	<b>36.1</b>
Fungal infection		<b>144</b>	<b>20.7</b>
	Dermatophytosis	91	13.1
	Onychomycosis	51	7.3
	Candidiasis	2	0.3
Viral infection		<b>54</b>	<b>7.8</b>
	Herpes zoster	32	4.6
	Herpes simplex	19	2.7
	Molluscum contagiosum	2	0.3
	Verruca Vulgaris	1	0.1
Bacterial infection		<b>45</b>	<b>6.4</b>
	Scalp folliculitis	9	1.2
	Cellulitis	15	2.2
	Impetigo	21	3.0
Parasitic infection		<b>8</b>	<b>1.2</b>
	Scabies	8	1.2
<b>II. Non –infectious skin disease</b>			
Eczemas		<b>241</b>	<b>34.7</b>
	Xerotic eczema	129	18.6
	Seborrhoeic eczema	27	3.9
	Contact eczema	16	2.3
	Nummular eczema	31	4.5
	Neurodermatitis	16	2.3
	Hand eczemas	10	1.4
	Atopic eczemas	12	1.7
Papulosquamous disorders		<b>45</b>	<b>6.5</b>
	Psoriasis	26	3.8
	Lichen planus	19	2.7
Keratinization disorders		<b>18</b>	<b>2.6</b>
	Keratoderma	18	2.6
Autoimmune disorders		<b>10</b>	<b>1.4</b>
Tumours	Connective tissue diseases	2	0.3
	Blistering diseases	8	1.1
	Kaposi sarcoma	<b>8</b>	<b>1.2</b>
	Keloids	7	1
		1	0.2
Cutaneous vascular disorders		<b>8</b>	<b>1.2</b>
	Venous stasis ulcers	6	0.9
	Lymphedema	2	0.3

Table 3 Univariate and Multivariate Analysis of the Factors Associated with Dermatological Disorder

Variable	Univariate analysis			Multivariate analysis		
	cPR	95% CI of cPR	P -value	aPR	95% CI of aPR	P - Value
<b>Wealth Classes</b>						
1	1.14	1.03 – 1.26	<b>0.010</b>	1.13	1.02 – 1.25	<b>0.022</b>
2	1.09	0.98 – 1.23	0.124	1.08	0.95 – 1.23	0.224
3	1.11	0.99 – 1.24	0.058	1.10	0.98 – 1.23	0.112
4	1.05	0.93 – 1.18	0.428	1.03	0.91 – 1.17	0.598
5	Ref					
<b>Level of education</b>						
No formal education	0.97	0.87 – 1.09	0.618	0.97	0.84 – 1.13	0.702
Primary	0.91	0.82 – 1.01	0.079	0.94	0.83 – 1.07	0.363
Secondary	0.95	0.86 – 1.05	0.328	0.95	0.85 – 1.05	0.325
College/University	Ref					
<b>Occupation</b>						
Retired	1.03	0.96 – 1.11	0.440	1.03	0.94 – 1.13	0.532
Employed	0.97	0.83 – 1.13	0.967	0.96	0.82 – 1.13	0.602
Self employed	0.99	0.92 – 1.08	0.912	0.99	0.91 – 1.09	0.921
Unemployed	Ref					
<b>Hypertension</b>						
Yes	0.96	0.90 – 1.03	0.292	1.02	0.92 – 1.13	0.659
No	Ref					
<b>Diabetic Mellitus</b>						
Yes	0.94	0.86 – 1.03	0.156	0.95	0.83 – 1.07	0.388
No	Ref					
<b>Heart problem</b>						
Yes	1.09	0.99 – 1.18	0.063	1.12	0.99 – 1.27	0.061
No	Ref					
<b>HIV/AIDS</b>						
Yes	1.06	0.94 – 1.19	0.340	0.96	0.81 – 1.13	0.606
No	Ref					
Key: cPR: crude Prevalence Ratio, aPR: adjusted Prevalence Ratio, CI: Confidence Interval, Ref: Reference group.						

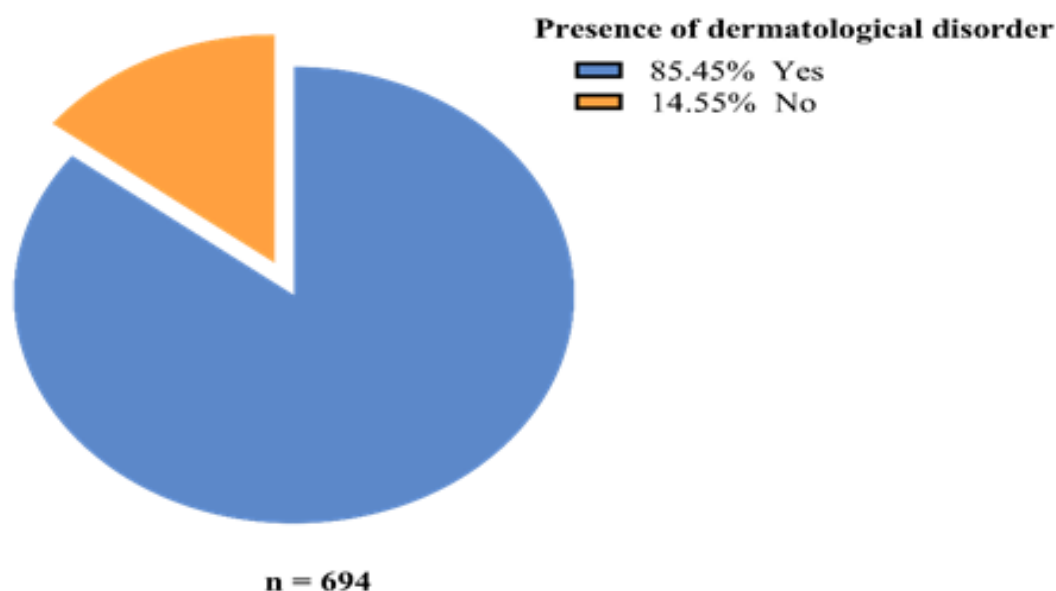


Fig 2 The Overall Prevalence of Dermatological Disorders in Elderly



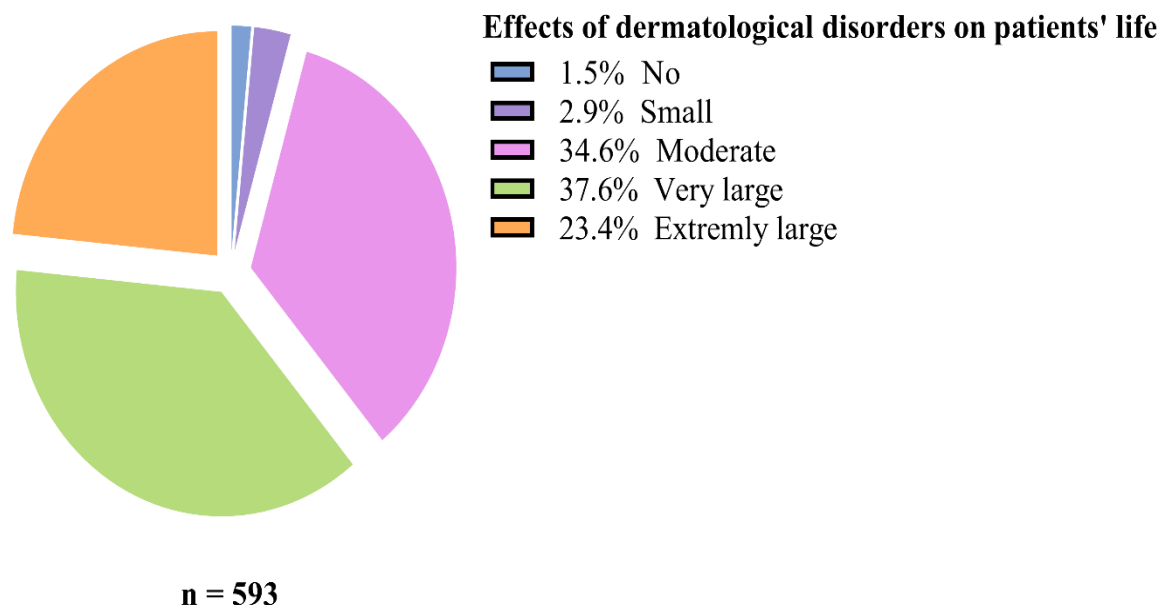


Fig 3 Levels of the Effect of Dermatological Disorders Among patients

STROBE Statement—Checklist of Items that Should be Included in Reports of *Cross-Sectional Studies*

	Item No	Recommendation	Page No
<b>Title and abstract</b>	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
<b>Introduction</b>			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2
Objectives	3	State specific objectives, including any prespecified hypotheses	2
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	3
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	3
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	3
Bias	9	Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	4
		(b) Describe any methods used to examine subgroups and interactions	
		(c) Explain how missing data were addressed	
		(d) If applicable, describe analytical methods taking account of sampling strategy	
		(e) Describe any sensitivity analyses	
<b>Results</b>			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	10
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	5,10
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	4,5
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	5
		(b) Report category boundaries when continuous variables were categorized	
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	5
<b>Discussion</b>			
Key results	18	Summarise key results with reference to study objectives	6
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	6
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	6
Generalisability	21	Discuss the generalisability (external validity) of the study results	6
<b>Other information</b>			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	

\*Give information separately for exposed and unexposed groups.

- *Note:- An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).*