



**Saint Paul's Hospital Millennium Medical College**

**Residency program**

**Department of Dermatovenereology**

**Magnitude and Factors Associated with Seborrheic Dermatitis among Adult Patients Attending Dermatovenereology Outpatient Department at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia.**

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## **ACRONYMS AND ABBREVIATIONS**

**ASD:** Adult Seborrheic Dermatitis

**BMI:** Body Mass Index

**HIV:** Human Immune Deficiency Syndrome

**OPD:** Outpatient Department

**SD:** Seborrheic Dermatitis

**SPHMMC:** Saint Paul's Hospital Millennium Medical College

## Abstract

**Background:** Seborrheic dermatitis (SD) is a common inflammatory skin disorder affecting sebaceous-gland-rich areas and significantly impacting patients' quality of life. Understanding its magnitude, clinical characteristics, and associated factors is essential for effective management.

**Objective:** The objective of this study is to assess the magnitude and factors associated with seborrheic dermatitis among adult patients attending the Dermatovenereology Outpatient Department.

**Methods:** A hospital-based cross-sectional study was conducted from July 1 to December 30, 2025, among 378 dermatology outpatients. Systematic random sampling was used to select participants. Data on socio-demographics, clinical characteristics, lifestyle factors, and comorbidities were collected using a pretested structured questionnaire. Data were analyzed using SPSS version 27. Descriptive statistics summarized participant characteristics, and bivariable and multivariable logistic regression analyses identified factors associated with SD. Variables with  $p \leq 0.05$  in multivariable analysis were considered statistically significant.

**Results:** A total of 378 dermatology patients participated in the study, with a mean age of  $38.9 \pm 11.6$  years. The majority of participants were male (56.3%) and married (63.8%). Seborrheic dermatitis (SD) was present in 29.1% of patients, with the scalp being the most commonly affected area (23.8%) and itching (19.3%) as the predominant symptom. Patients aged 18–37 years had 1.75 times higher odds (AOR = 1.75; 95% CI: 1.10–2.79), and those aged 38–57 years had 9.16 times higher odds (AOR = 9.16; 95% CI: 1.13–10.5) of developing SD. Employment was found to be protective, with employed individuals having a lower risk of SD (AOR = 0.57; 95% CI: 0.35–0.93). Alcohol drinking having 3.29 times higher odds of developing the condition (AOR = 3.29; 95% CI: 1.19–9.1).

**Conclusion:** The magnitude of seborrheic dermatitis among adult patients attending the Dermatovenereology Outpatient Department was 29.1%. Patients aged 18–37, 38–57 years, and Alcohol drinking having were factors associated with SD. In contrast, employment status appeared to have a protective effect against the development of the disease.

**Key words:** Prevalences, Seborrheic dermatitis, Risk factors, Ethiopia.

# **1. INTRODUCTION**

## **1.1. Background of the study**

Seborrheic dermatitis (SD) is a common, chronic, and relapsing skin condition characterized by papulosquamous morphology in areas rich in sebaceous glands. It is a non-contagious skin condition that leads to scaly patches of skin with oily, dandruff-like flakes, especially on the face and scalp [1, 2]. This skin disease typically affects the scalp, central face, and anterior chest. In adolescents and adults, it often presents as scalp scaling. The condition is also known to affect the sebum-rich areas of the scalp, face, and trunk [3].

SD affects all age groups and men experience it more frequently than women, probably because androgens stimulate sebum production[4, 5]. It is considered that approximately 1-3% of the immunocompetent population is affected by this disease[6]. Although, the exact cause of the disease is not known, some risk factors, such as genetic predisposition, male gender, light skin color, generalized skin dryness, winter season, and proliferation of *Malassezia* species have been implicated in the etiology of the disease or triggering of attacks [7-9].

SD may have a psycho-social impact and affects quality of life by causing discomfort from itching, unsightly clothing marks, and social unease specially, with high disease severity and facial involvement [10-12]. The global prevalence of SD remains inadequately defined, but it is recognized as a prevalent condition, especially in infants and young adults[13, 14]. However, the prevalence of SD among adults in the general population is reported to be between 1-10%. It is more common in men than in women and typically presents between the ages of 30 and 40 years[15].

Seborrheic dermatitis (SD) is influenced by various sociodemographic factors, including age[16], gender and life style[7], and geographic location[17, 18]. Male sex, light skin color, winter season, and high abundance of *Malassezia* yeasts on the skin are suggestive risk factors for SD. high fruit intake was associated with less seborrheic dermatitis [19]. Moreover, regular alcohol use and higher BMI increased prevalence of seborrheic dermatitis and has a greater risk of seborrheic dermatitis flares[20].

The prevalence of SD in Ethiopia has been reported to be 17.4 among school children in rural Ethiopia[21] . In spite of the continued increase in the prevalence of SD; there is a huge research gap on prevalence of SD and associated factors among adults in Ethiopia. Furthermore, the findings of this study contribute to battling the SD among this segment of the population through providing evidence to the concerned bodies for possible intervention. Therefore, this study aims to determine the magnitude of SD and its associated factor among adult's patients at St. Paul's Hospital Millennium Medical College, 2025.

## **1.2. Statement of the problems**

Seborrheic dermatitis (SD) imposes a heavy global burden on public health as well as socio-economic development. It is one of the largest global public health concerns, and a study found that the overall prevalence of seborrheic dermatitis in the general population is between 2.35% and 11.30% [22]. This disease can be aesthetically embarrassing and can decrease quality of life of those suffering from chronic relapsing course. On top of that, this disease has significant negative impacts on their emotional, physical, and social life, as well as their daily hygiene and daily work life [23, 24]. In Ethiopia, the prevalence of seborrheic dermatitis among children was assessed. However, the severity and prevalence of seborrheic dermatitis among adults was not specifically addressed. Thus, knowing the prevalence and severity of SD among adults will create an opportunity for stakeholders and the Ministry of Health to implement management guidelines, algorithms, prevention strategies, and effective treatment modalities.

In Africa, studies on the prevalence of seborrheic dermatitis in adults are rare. However, it is one of the five most common diagnoses of skin disease and is more common among women. The estimated prevalence of seborrheic dermatitis is 2.9%-6% [25, 26].

The Global Burden of Disease (GBD) study is a vital resource for understanding the magnitude of SD, providing essential data on the magnitude and associated with the condition [27]. However, there is dearth of data that will give an information for other researchers and clinicians towards the magnitude of SD among adult population.

In Ethiopia, seborrheic dermatitis (SD) affects 17.4% of pediatric patients, making it the second most common skin condition and imposing significant physical and psychosocial burdens, especially for those attending dermatology clinics. However, the prevalence and associated factors of SD among adults remain poorly explored at the health facility level [21].

### **1.3. Significance of the study**

Given that there are no existing studies on seborrheic dermatitis in Ethiopia, this research will provide better understanding about the prevalence and contributing factors of seborrheic dermatitis in adults within the study setting. Therefore, this finding will enable the dermatovenerology centers to develop comprehensive and appropriate management strategies, and will also provide an insight towards the magnitude of SD in the research area.

Most importantly, there has been no research done in a similar field of interest within the study area. Therefore, grasping the prevalence and factors related to SD in adults helps clinicians and dermatovenerology healthcare institutions in improving clinical interventions. Additionally, it will act as baseline reference data for researchers interested in conducting additional research on SD.

This study provides valuable insights for the Ministry of Health, dermatovenerology institutions, and other stakeholders to understand the magnitude of SD, raise public awareness, and develop effective prevention and management strategies. By addressing factors linked to the condition, the findings can guide health education initiatives and inform policy decisions. Since there are no comparable studies in this research area, the results also serve as important evidence for future research, offering a foundation for further studies and interventions.

## **2. LITERATURE REVIEW**

### **2.1 Overview of seborrheic dermatitis**

Seborrheic dermatitis (SD) affects approximately 1–3 % of the general population and has a higher prevalence in immunocompromised individuals which is 34-83% [28, 29]. The etiology of SD remains unknown, although several factors, such as the genus *Malassezia*, hormones, environmental, genetic predisposition, stress, are mentioned but an abnormal inflammatory reaction of the body to the fungus *Malassezia* plays the major role [30] . This skin disease is common among adults and children [11, 29]. However, its prevalence is higher in individuals with skin type I (6.6%) and skin type II (6.2%) compared to other skin types[31].

### **2.2 Prevalence of seborrheic dermatitis**

Globally, the prevalence of seborrheic dermatitis (SD) reports is different, and research indicates that the overall prevalence of scalp seborrheic dermatitis is approximately 3.3%, with significant demographic variations. The condition is most prevalent in East Asia and least in North America, where rates range from 1% to 5%. Prevalence peaks in middle-aged adults (3.4% for ages 16-39) and declines in older age groups. Gender wise , there is no significant difference in prevalence between men and women, although men report a higher impact on quality of life [17].

The global pooled prevalence of SD is found to be 4.38% and subgroup analyses showed that there are variations by age, and it was observed high prevalence in adults compared to children and neonates. Concerning geographic analyses, the highest prevalence of seborrheic dermatitis was observed in South Africa, affecting 8.82 % of individuals, while the lowest prevalence was reported in India, at 2.62 % [13].

The prevalence of seborrheic dermatitis in Europe is estimated to be around 4.38% [24]. However, the prevalence can vary depending on the specific region and population being studied. For example, one study found that the prevalence of seborrheic dermatitis was 4.6% in males and 1.4% in females in a European population [16]. Another study found that the prevalence of seborrheic dermatitis was higher in Western Europe, with a pooled prevalence of 5.5%[32].

In United States, with prevalence rates of SD varying across studies and the overall prevalence of SD is estimated to be between 1% and 8% of the adult population, with specific studies reporting rates around 1-3%. Notably, a large-scale examination found a prevalence of 3.2% among a diverse population, with higher rates observed in males (4.6%) compared to females[33, 34].

In Asia the prevalence of SD is estimated to be between 1-5% in adults [35]. However, the reported rate of seborrheic dermatitis can range from 0.02% to 30.03% in individual studies. The prevalence of SD in Indonesia showed 0.99-5.8% of all dermatology cases from 2013 to 2015 [36], in Malaysia 17.16% , in Guangzhou 2.85% , and in Macao 2.66%[37] .

The prevalence of seborrheic dermatitis in China is estimated to be between 1-5% in adults [35]. However, larger population-based studies are lacking, and the etiology of the disease is not well understood . A study found that the prevalence of seborrheic dermatitis symptoms was highest in Chongqing (3.5%) and lowest in Shanghai (2.1%)[38] . In India the prevalence of SD varies across different studies and populations. A study in India by Banerjee et al[39] reported that 13.4% of kids aged <5 years had seborrheic dermatitis. In another study by Pillai et al.[40], in Indian adults having scalp dermatoses, 18.7% of cases were recognized as seborrheic dermatitis. Its incidence is 1%–3% in the general population as compared to 34%–83% in immune-compromised people. In 2012 a study done by Breunig et al [41] in Brazil revealed that prevalence of scalp SD was 11%. White skin [and triceps skin fold >19.5 mm was significantly associated with scalp SD.

In 2024, a systematic review and meta-analysis report of 121 studies conducted in 9 countries and involving 1,260,165 people showed that the prevalence of SD in South Africa, Nigeria and Egypt was 8%, 3.61%, 3.52% respectively. The prevalence of seborrheic dermatitis was high in Sub-Saharan Africa and North America. In 2020 a retrospective study done by Assefa GT et al[42] in Hawassa university comprehensive specialized hospital revealed that SD was the second most common type of skin disease [21].

## **2.3 Factors associated with seborrheic dermatitis**

### **Sociodemographic factors**

A study done by Sanders et al [7] in Netherlands showed that age, sex, obesity, skin colour, status depression, status of hypertension , education level, climate, status of skin dryness , history of

alcohol and tobacco use were associated factors for seborrheic dermatitis . Moreover, another case-control studies by Akbaş et al. showed that seborrheic dermatitis was associated with higher BMI when compared with controls [43]. Another cross sectional study done by park et al in South Korea revealed that male gender, disease duration  $\geq 7$  years and a history of acne were factors associated with SD[44].

In India a review article done by Nagateja et al. listed that age, male sex, HIV, neurological , psychiatric diseases, and exposure to certain drug treatments were factors associated with SD [45].

### **Life style related factors**

A review literature done by Dall'Oglio et al in Italy showed that environmental factors like cold, low humidity, excessive sun exposure , physical/psychological stress, unhealthy lifestyle (alcohol consumption, wrong or inadequate cosmetic use, factors associated to SD [46]. On top of that, other studies investigated that regular alcohol consumption is associated with a greater risk of seborrheic dermatitis flares. A case control and case cross over study done in Paris by lancer et al showed that past history of tobacco consumption, alcohol consumption, and higher level of stress were associated with SD [10, 47].

### **Dietary related factors**

In 2019 a study done by Sanders et al [19] revealed that a Western diet like processed meat, refined grains, and potatoes, linked to a higher risk of seborrheic dermatitis in females. In contrast, increased amount of fruit diet was associated with a lower risk of seborrheic dermatitis. However, other study done in Turkey by tamer et al. showed that dietary habits were not associated with increased risk of seborrheic dermatitis [15]. The consumption of fruits might reduce the likelihood of having seborrheic dermatitis via consumption of a wide variety of vitamins and other compounds (e.g., flavonoids, antioxidant) that have been shown to reduce inflammation in several diseases[7].

## Disease related factors

Seborrheic dermatitis prevalence is higher with emotional stress and in patients with depressive disorders [38]. This could be due to elevation of glucocorticoids, which are known to inhibit epidermal lipid synthesis and secretion [39] as well as delay barrier recovery [40]. SD has also been associated with Parkinson's disease [41]. These associations must be interpreted with caution as there is the potential for confounding lifestyle factors to be involved, such as the increased tendency to remain indoors, with low sunlight exposure found to be correlated with SD. Factors associated with seborrheic dermatitis include age, male sex, HIV, neurological and psychiatric diseases, and exposure to certain Medications like Atypical antipsychotics drugs (olanzapine), antineoplastic agents (Dasatinib), Corticosteroids, testosterone, and certain antidepressants, can trigger or worsen seborrheic dermatitis [45].

A significant association exists between stress and SD, with studies indicating that higher stress levels can exacerbate symptoms. A review literature study done by Diop et al in Senegal showed the hospital incidence rate of SD was 1.6%. Factors associated with seborrheic dermatitis include stress, systemic diseases, and atopy. Additionally, scalp localization is linked to female gender, married status, and systemic diseases, while facial localization is related to male gender [48].

In general, different articles have mentioned the contributing factors for seborrheic dermatitis among adult patients. Sociodemographic factors like age, gender, educational status, marital status, skin color and type are major contributing factors for SD. Concerning disease-related characteristics like comorbidities of HIV, depression, Parkinson's disease, and neurological and psychiatric diseases were also contributing factors for SD among adult patients. Lifestyle factors like low humidity, excessive sun exposure, alcohol and tobacco consumption, wrong or inadequate cosmetic use, excessive Western diet (meat, potatoes, and alcohol) consumption, reducing fruit and vitamin intake were associated factors for seborrheic dermatitis.

The outcome variable of seborrheic dermatitis magnitude and an associated factors is influenced by multiple independent factors. Sociodemographic characteristics Age, sex, occupation, Education, monthly income, residency area, Religion, Marital status often showing higher prevalence [13]. Lifestyle factors such as Consumption of vegetables, consumption of fruits, western diet, physical exercise, smoking, alcohol use also high in SD patients [19]. Additionally,

clinical related factors such as skin color, anatomical site of SD, disease duration, co-morbidity, concurrent skin disease, BMI, stress level, aggravating factors, medication [13, 49]. These variables collectively interact to determine the factors associated with SD, as illustrated in the conceptual diagram adapted from [13, 19, 49].

## Conceptual framework

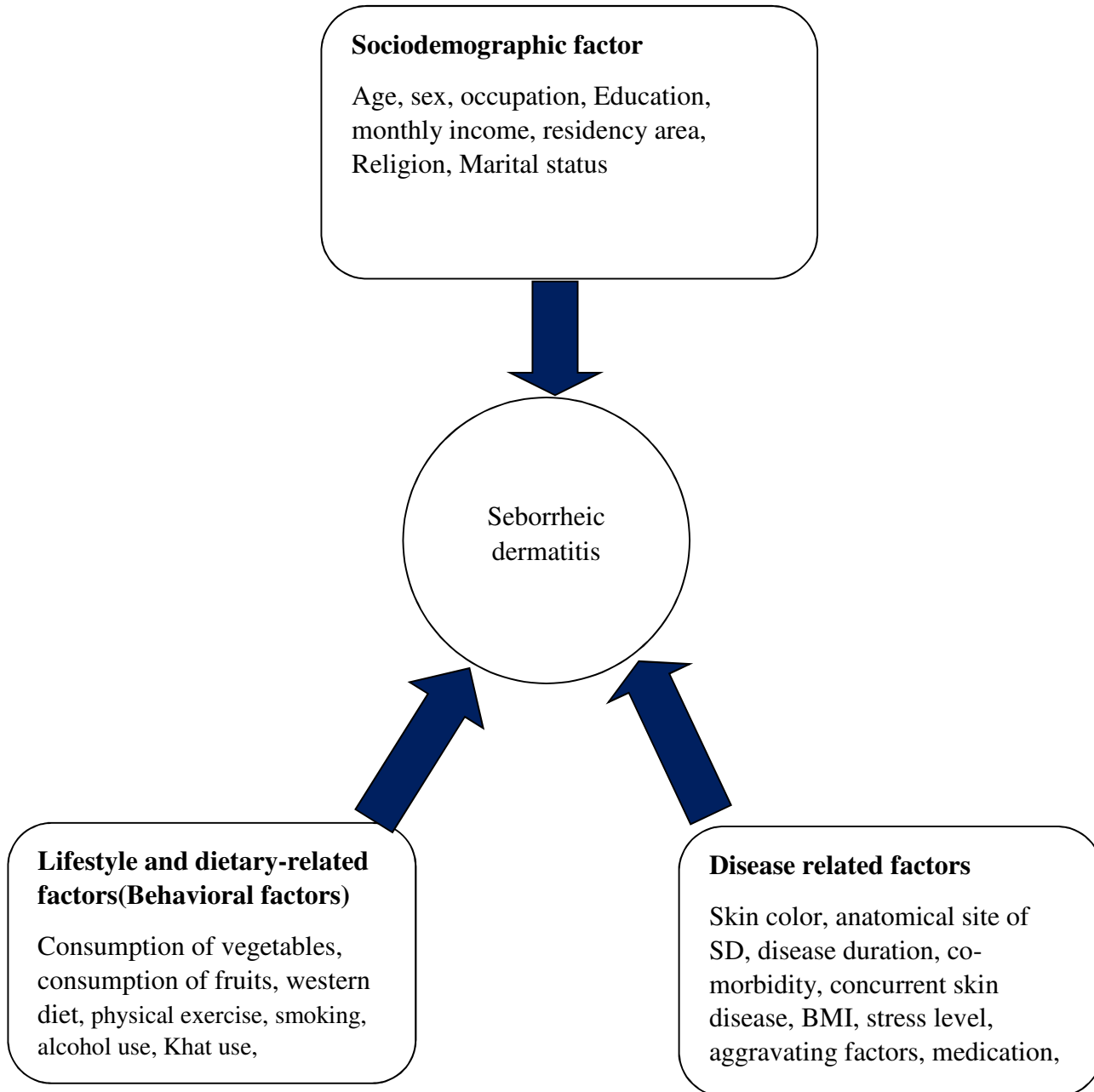


Figure 1:-Conceptual Frame Work for Prevalence and Factors Associated with seborrheic Dermatitis among Adult Patients.

### **3. OBJECTIVES OF THE STUDY**

#### **3.1. General objectives**

To determine the magnitude and identify associated factors towards seborrheic dermatitis among adult patients visiting dermatovenerology outpatient department at Saint Paul's Hospital Millennium Medical College in Addis Ababa, Ethiopia.

#### **3.2. Specific objectives**

To determine the magnitude of seborrheic dermatitis among adult patients visiting dermatovenerology outpatient at Saint Paul's Hospital Millennium Medical College in Addis Ababa

To identify the factors associated with seborrheic dermatitis among adult patients visiting Dermatovenerology outpatient at Saint Paul's Hospital Millennium Medical College in Addis Ababa

## **4. METHODS AND MATERIALS**

### **4.1. Study setting and period**

The study was conducted at Dermatovenerology outpatient department at Saint Paul's Hospital Millennium Medical College (SPHMMC) in Addis Ababa. It is the second largest tertiary hospital in the country. It was established in 1968 by the emperor Haile Selassie. The college has more than 2800 clinical, academic and administrative and support staffs. While the inpatient capacity is more than 700 beds, the hospital sees an average of 1200 emergency and outpatient clients daily. Dermatovenerology outpatient department is located behind the main compound of SPHMMC, in the former school of tomorrow compound on the 3<sup>rd</sup> floor of building. The medical school was established in 2007. The department of Dermatovenerology has five (5) OPDs and one minor operation room. It has eight (8) Dermatovenerology specialist, one Dermatosurgeon, 20 residents and six clinical nurses, according to the department report. The study was conducted from July 1 to December 30.2025.

### **4.2. Study design**

A hospital-based cross-sectional study design was conducted.

### **4.3. Population**

#### **4.3.1. Source population**

The source population for this study was all dermatology patients attending the Dermatovenerology outpatient department at Saint Paul's Hospital Millennium Medical College.

#### **4.3.2. Study population**

All selected patients visiting Dermatovenerology outpatient department at Saint Paul's Hospital Millennium Medical College during the study period who fulfil the eligibility criteria.

### **4.4. Eligibility criteria**

#### **4.4.1. Inclusion criteria**

All patients above  $\geq 18$  years old and visiting Dermatovenerology outpatient Department at Saint Paul's Hospital Millennium Medical College during the study period.

#### **4.4.2. Exclusion criteria**

- Age less than 18
- Critically ill patients who were unable to provide the appropriate information were excluded from the study.

### **4.5. Sample size determination and sampling technique**

#### **4.5.1. Sample Size Determination**

The required sample size is determined using a single population formula [50], where the prevalence of SD in the study area was unknown. A 50% prevalence ( $p = 0.5$ ) was considered to calculate the sample size. The chosen margin of error will be 5% with a 95% confidence level.

$$n = \frac{(Z_{\alpha/2})^2 (p) \times (1-p)}{d^2}$$

where: **n** is the initial sample size

- **$Z_{\alpha/2}$**  = is the standard score value for a 95 % confidence level for two sides of normal distribution = **1.96**

- **p** = is the proportion of respondents = **0.5**
- **d** = is margin of error = **0.05**

$$n = \frac{(Z_{\alpha/2})^2 (p) \times (1-p)}{d^2}$$

$$n = \frac{(1.96)^2 (0.5) (1-0.5)}{(0.05)^2}$$

$$n = 384 .$$

Since the total population for this research is less than 10,000, According to the Dermatology OPD HMIS, 1200 dermatology patients were seen over the past 6 months. Thus, we use the correction formula.

$$nf = \frac{no}{1 + \frac{no}{N}} = 384 / 1 + no/N = 291$$

Were

- $n_f$  = final sample size
- $n_o$  = initial calculated sample size which is 384
- $N$  = total population which is 1200
- With the population correction formula, the final sample size ( $n_f$ ) will be 291.

By adding 10% contingency (non-response rate) which is 29, the final sample size became 320.

### Sample Size Determination for Associated Factors

The sample size for the second objective was calculated using the Stat-calc of Epi Info statistical software version 7.2.6.0 with the following assumptions: Confidence level = 95%, Power = 80%, the ratio of unexposed to exposed 1.0

**Table 1: Sample size calculation from prior related studies for some selected factors associated with SD among adult patients.**

| Variables           | Assumptions |      |       |       |     | Sample size | References |
|---------------------|-------------|------|-------|-------|-----|-------------|------------|
|                     | OR          | P    | Ratio | Power | CI  |             |            |
| Alcohol consumption | 10.2        | 86.2 | 1     | 80%   | 95% | 378         | 10         |
| Male                | 11.97       | 62.8 | 1     | 80%   | 95% | 253         | 43         |

The final sample size for the study was determined by first calculating the number of participants required for the primary objective and then for the second objective. For the primary objective by adding a 10% contingency (non-response rate), which amounted to 29 participants, the initial sample size of 291 increased to a final sample size of 320. For the second objective, which aimed to identify factors associated with seborrheic dermatitis (SD), sample size was estimated based on prior studies evaluating selected risk factors. Using assumptions for odds ratios, prevalence in the reference group, a 1:1 ratio of exposed to unexposed, 80% power, and 95% confidence interval, it was found that variables such as alcohol consumption and male sex required sample sizes of 378 and 253, respectively, to detect significant associations. The final sample size of 378 was considered adequate to address both objectives.

#### **4.5.2. Sampling procedures**

A systematic random sampling technique was employed. The outpatient department of the Dermatovenereology unit at Saint Paul's Hospital Millennium Medical College provided services five (5) days per week, and an average of about 1,200 new dermatology cases had been seen over the preceding six months. Hence, by dividing the total number of patients attending the hospital over six months (1,200) by the planned sample size (320), the sampling interval was determined to be four. To initiate sampling, the first participant was selected using a simple random sampling method from among the first four patients, and the fourth patient was included. Thereafter, every consecutive fourth patient was selected until the required sample size was achieved.

#### **4.6. Study variable and measurement**

##### **4.6.1. Dependent variable**

Magnitude of seborrheic dermatitis (presences /Absences)

##### **4.6.2. Independent variable**

**Sociodemographic characteristics:** Sex (male and female), Age, Residence (urban and rural), Educational status (Illiterate, primary, secondary, and higher education), Marital Status (Married, Single, Divorced, and Widowed), Employment status (employed, unemployed), and monthly income, Religion (orthodox, Muslim, protestant, other)

**Behavioral characteristics:** smoking status (Yes, and No), Alcohol use status (Yes, and No), and Khat chewing status (Yes, and No), physical exercise (Yes, (No), dietary habit (vegetable only, mixed meal only, and sun exposure(Yes, No)

**Clinical characteristics:** skin type normal, oily, dry, and mixed), Anatomical Site of SD involvement (Face, Head, groin area), disease duration, Co-morbidity (Yes and No), stress level (Yes and No), family Hx of SD(Yes,No), aggravated factor (Yes, No), and medication history (Yes, No).

#### 4.7. Operational definition

- **Western diet:** This a diet that contains pre-packaged foods, refined grains, red meat, processed meat, high-sugar drinks, candy, sweets, fried foods, animal products, high-fat dairy products, and high-fructose products [51].
- **seborrheic dermatitis (SD):** is a chronic, recurring inflammatory skin disorder that usually appears on the scalp, face, chest, back, axilla, and groin, characterized by erythema, greasy scaling intermittent itching and diagnosed by a dermatologist based on history and physical examination [52].
- **Functional(basic) skin type;** there are four basic skin types, which are normal(smooth &soft) , oily(frequently oily after few hours of washing), dry(easily flaking and with wrinkles) and combination( e.g. mix of oil with normal) which is mainly determined by genetics, but influenced by internal and external factors like hormonal, environmental etc.
- **BMI:** is a numerical value of your weight in relation to your height. A BMI between 18.5 and 25 kg/m<sup>2</sup> indicates a normal weight. A BMI of less than 18.5 kg/m<sup>2</sup> is considered underweight. A BMI between 25 kg/m<sup>2</sup> and 29.9 kg/m<sup>2</sup> is considered overweight. A BMI of 30 kg/m<sup>2</sup> or higher is considered obese (52)

#### 4.8. Data collection tool, method, and procedures

A data collection tool is developed from previous similar literature[19, 31, 41, 53-55] that contains socio-demographic and behavioral characteristics, clinical characteristics, and dietary and life style characteristics. Moreover, the three-part data collection tool is designed based on study objectives. The first part of the questionnaire questions focusses on sociodemographic information such as Sex, Age, Residence, Educational status, Marital Status, Employment status,

and monthly income. The second part of the tool contains questions regarding the Clinical characteristics such as skin color, Body mass index (BMI), Anatomical Site of SD involvement, Disease duration, Co-morbidity, and stress level, and the third part contains questions which assess behavioral characteristics of study participants such as Physical activity states, dietary patterns, smoking status, Alcohol use status, and Khat chewing status. Data was collected by three dermatology residents using a Validated and structured interviewer-administered questionnaire prepared by the researcher considering the variables in the literature review. The principal investigator of the study controlled the overall activity.

#### **4.9. Data quality assurance**

Before the main data collection, the questionnaire was pretested among 10% of the study participants, conducted two weeks prior to the actual study on patients who were not included in the final study sample. These pretest participants were solely used to assess the clarity, understandability, and simplicity of the questionnaire, and any necessary modifications were made based on their feedback. This ensured that the tool was appropriate and reliable for use in the main study population, without influencing the final study results. The questionnaire was initially developed in English, translated into the local language (Amharic) by an expert, and then back-translated into English to ensure consistency. Training on data collection was provided to data collectors for two days before the actual data collection period. All data collectors were trained on proper data collection procedures and confidentiality and Google format was used for data collection. Furthermore, the principal investigator strictly followed the overall data collection activities on a daily basis to ensure the completeness of the questionnaires and to provide further clarification when necessary.

#### **4.10. Data processing and analysis**

The collected data were checked for completeness, coded, and entered into EpiData version 3.1, and then exported to SPSS version 27 for analysis. Descriptive statistics were used to describe the study participants in relation to relevant variables. Bivariable and multivariable logistic regression analyses were performed to identify possible associations between independent and outcome variables. Variables with p-values less than 0.25 in the bivariable analysis were entered into the multivariable analysis to control for confounding effects. Variables with a p-value of  $\leq$

0.05 in the multivariable analysis were considered significantly associated with the outcome variable. For the analysis, multivariate logistic regression was performed to identify factors independently associated with seborrheic dermatitis. To ensure the reliability of the model, goodness-of-fit was assessed using the Hosmer–Lemeshow test, with a p-value >0.05 indicating an acceptable fit. Additionally, multicollinearity among independent variables was evaluated using the variance inflation factor (VIF) and tolerance statistics, where variables with VIF >10 or tolerance <0.1 would indicate high collinearity and potential exclusion from the model. Finally, the study results were presented using tables, figures, and text.

#### **4.11. Ethical consideration**

Ethical approval was obtained from the Institutional Ethical Review Board of St. Paul’s Hospital Millennium Medical College (SPHMMC), and formal permission was granted by the board. Written informed consent was obtained from each participant after explaining the objectives of the study in a language they could understand. For this purpose, a one-page information sheet and consent form were attached to the cover page of each questionnaire. The confidentiality of the results and the privacy of the study participants were strictly maintained.

#### **4.12. Dissemination of result**

After conducting the research, the findings were presented during the defense. The results of the study were submitted to the Dermatovenereology and Public Health departments of St. Paul’s Hospital Millennium Medical College. In addition, attempts will be made to present the findings at scientific conferences and to publish them in a peer-reviewed journal.

## 5. Result

### 5.1. Socio-demographic characteristics of the study participants

Sociodemographic characteristics of the study participants are presented in Table 1. A total of 378 study participants were included in the study, with a mean age of  $38.0 \pm 11.5$  years. Nearly half of the study participants were in the 18–37 years age group ( $n = 183$ , 48.4%), followed closely by those aged 38–57 years ( $n = 180$ , 47.6%). More than half of the study participants were male ( $n = 216$ , 56.3%). Regarding marital status, the majority of the study participants were married ( $n = 241$ , 63.8%).

In terms of employment, most of the study participants ( $n=275$ , 72.8%) were employed. Among those employed, the mean monthly income was  $8000 \pm 6733$  Ethiopian Birr. With respect to religious affiliation, most study participants were Orthodox Christians ( $n = 326$ , 86.2%).

Regarding educational status, the largest proportion of the study participants had completed secondary education ( $n = 154$ , 40.7%). The vast majority of the study participants resided in urban areas ( $n = 358$ , 93.2%).

**Table 2:** Socio-demographic characteristics of dermatology patients attending St. Paul’s Millennium Medical College, at dermatology OPD, Addis Ababa, Ethiopia, from July 1, 2025, to December 30, 2025 ( $n=378$ )

| Variable       | Category      | Frequency       | Percentage (%) |
|----------------|---------------|-----------------|----------------|
| Age            | 18-37         | 183             | 48.4           |
|                | 38-57         | 180             | 47.6           |
|                | $\geq 58$     | 15              | 4.0            |
|                | Mean $\pm$ SD | $38.0 \pm 11.5$ |                |
| Gender         | Male          | 213             | 56.3           |
|                | Female        | 165             | 43.7           |
| Marital status | Married       | 241             | 63.8           |
|                | Unmarried*    | 137             | 36.2           |

|                     |                  |                 |      |
|---------------------|------------------|-----------------|------|
| Employment statues  | Employed         | 275             | 72.8 |
|                     | Unemployed **    | 103             | 27.2 |
| Monthly salary*275  | Mean $\pm$ SD    | 8000 $\pm$ 6733 |      |
| Religion            | Muslims          | 42              | 11.0 |
|                     | Orthodox         | 326             | 86.2 |
|                     | Protestant       | 9               | 2.4  |
|                     | Other***         | 1               | 0.3  |
| Educational statues | Illiterate       | 20              | 5.3  |
|                     | Primary          | 59              | 15.6 |
|                     | Secondary        | 154             | 40.7 |
|                     | higher education | 145             | 38.4 |
| Place of residency  | Rural            | 22              | 5.8  |
|                     | Urban            | 356             | 94.3 |

\*Unmarried ;Single, divorce, and widow \*\* unemployed: Retired, house wife,students \*\*\*

Wakefeta

## 5.2. Clinical characteristics and life style practices of the Seborrheic Dermatitis

Of these study participants, Seborrheic 110 (29.1%) study participants had diagnosed seborrheic dermatitis (SD) figure 1. Among from the total of SD diagnosed patients, the mean duration of the disease was  $0.77 \pm 1.62$  years. The scalp was the most commonly affected area 90(81.8%) see figure 2. The most frequently reported symptom was itching 73(66.4%). An oily skin type 65(59.1%) was the most common among SD affected study participants, and the majority of the study participants 73 (66.4%) had a BMI between 25–30 kg/m<sup>2</sup>. Majority 100(90.9%) and 87(79.1%) of the study participants had no family history of SD and concurrent skin diseases. Among study participants having of concurrent skin disease, 10(43.5%) had atopic dermatitis skin disease. Concerning the medical comorbidity condition, majority 352 (68.2%) of the study participants had no comorbid disease. However, Of the study participants having of medical comorbidity, few study participants 12 (34.3%) had diabetic disease condition. With regard to the stress level,

majority 92(83.6%) of the study participants had not stress at presentation. Majority 79 (71.8%) of the study participants were not using medication during SD diagnosis. However, few 12(38.7%) study participants were on antidiabetic medication. Concerning to the aggravating factors, majority 78(70.9%) of the study participants had no any SD aggravated factors. However, study participants having of aggravated factors, study participants living at low humidity living area 12 (37.55%) were the reported factors. More than half 65(59.1%) of the study participants engaged in physical activity rarely. Most participants reported intermittent sunlight exposure 97(88.1 %). Concerning to the substance use, 104(94.5 %), 93 (84.5%), and 98(89.1%) study participants were not reported cigarette, alcohol, and khat chewing practices at presentation table 3.

**Table 3:** clinical characteristics of dermatology patients attending at St Paul Millennium Medical College, at dermatology OPD unit, Addis Ababa, Ethiopia, from July 1, 2025 to December 30, 2025 (n=378)

| Variable                    | Category                    | Frequency | Percentage (%) |
|-----------------------------|-----------------------------|-----------|----------------|
| Seborrheic Dermatitis (SD)  | Yes                         | 110       | 29.1           |
|                             | No                          | 268       | 70.9           |
| Duration of SD (Year)       | Mean $\pm$ SD               | 0.77+1.62 |                |
| Associated symptoms (n=110) | Itching                     | 73        | 66.4           |
|                             | Itching & burning sensation | 37        | 33.6           |
| Skin type (n=110)           | Normal                      | 10        | 9.1            |
|                             | Oil                         | 65        | 59.1           |
|                             | Dry                         | 14        | 12.7           |
|                             | Mixed                       | 21        | 19.1           |
| BMI (n=110)                 | <25                         | 17        | 15.4           |
|                             | 25-30                       | 73        | 66.4           |
|                             | >30                         | 20        | 18.2           |

|                                                 |                     |     |      |
|-------------------------------------------------|---------------------|-----|------|
| Family history of SD<br>(n=110)                 | Yes                 | 10  | 9.1  |
|                                                 | No                  | 100 | 90.9 |
| Concurrent skin disease<br>(n=110)              | Yes                 | 23  | 20.9 |
|                                                 | No                  | 87  | 79.1 |
| If yes, list the type of skin<br>disease (n=23) | Atopic dermatitis   | 10  | 43.5 |
|                                                 | Psoriasis           | 2   | 8.7  |
|                                                 | Tinea capitis       | 2   | 8.7  |
|                                                 | Other               | 09  | 39.1 |
| Comorbidity (n=110)                             | Yes                 | 35  | 31.8 |
|                                                 | No                  | 352 | 68.2 |
| If yes, list the comorbid<br>disease (n=35)     | Diabetic mellites   | 12  | 34.3 |
|                                                 | HIV/AIDS            | 9   | 25.7 |
|                                                 | Dyslipidemia        | 2   | 5.7  |
|                                                 | Other               | 12  | 34.3 |
| Stress level (n=110)                            | Normal              | 92  | 83.6 |
|                                                 | Abnormal            | 18  | 16.4 |
| Medication use (n=110)                          | Yes                 | 31  | 28.2 |
|                                                 | No                  | 79  | 71.8 |
| If yes, list (n=31)                             | Anti diabetic drugs | 12  | 38.7 |
|                                                 | Antidyslipedemia    | 2   | 6.5  |
|                                                 | HAART               | 5   | 16.1 |
|                                                 | Other               | 12  | 38.7 |
| Aggravated factors<br>(n=110)                   | Yes                 | 32  | 29.1 |
|                                                 | No                  | 78  | 70.9 |
| If yes, list (n=32)                             | Alcohol consumption | 10  | 31.2 |

|                                        |                |     |      |
|----------------------------------------|----------------|-----|------|
|                                        | Cosmetics use  | 7   | 21.9 |
|                                        | Sun exposure   | 3   | 9.4  |
|                                        | Low humidity   | 12  | 37.5 |
| Daily Dietary practices<br>(n=110)     | Mixed          | 96  | 87.1 |
|                                        | Vegetable      | 12  | 10.9 |
|                                        | Animal product | 2   | 2    |
| Physical activity (n=110)              | Rarely         | 65  | 59.1 |
|                                        | Sometimes      | 39  | 35.5 |
|                                        | Usually        | 6   | 5.4  |
| sunlight exposure<br>frequency (n=110) | A little       | 8   | 7.3  |
|                                        | A lot          | 5   | 4.5  |
|                                        | Sometimes      | 97  | 88.2 |
| Smoking practices (n=110)              | Yes            | 6   | 5.5  |
|                                        | No             | 104 | 94.5 |
| Alcohol drinking practice<br>(n=110)   | Yes            | 17  | 15.5 |
|                                        | No             | 93  | 84.5 |
| Khat chewing practices<br>(n=110)      | Yes            | 12  | 10.9 |
|                                        | No             | 98  | 89.1 |

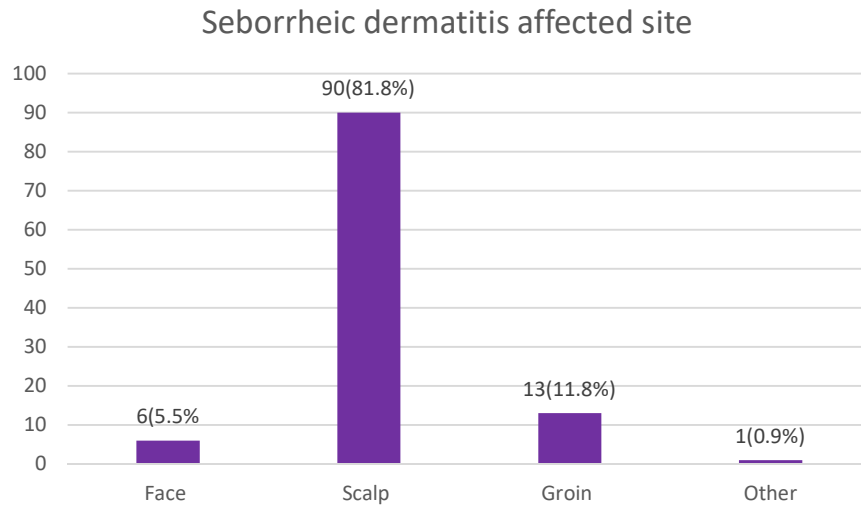


**Figure 2:** Seborrheic dermatitis affected site at SD patients attending at St Paul millennium medical college, at dermatology OPD unit, Addis Ababa, Ethiopia, from July 1, 2025 to December 30, 2025 (n=110)

### Prevalence of Seborrheic dermatitis

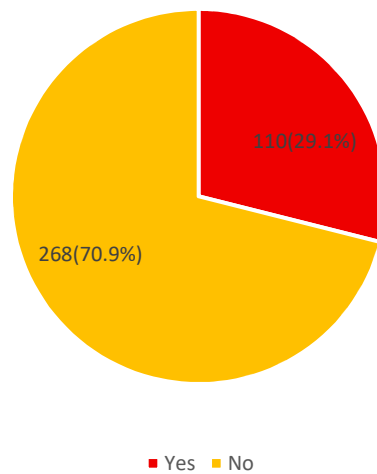


**Figure 1:** prevalence of seborrheic dermatitis dermatology patients attending at St Paul Millennium Medical College, at dermatology OPD unit, Addis Ababa, Ethiopia, from July1, 2025 to December 30, 2025 (n=378)

### 5.3. Factors Associated with seborrheic dermatitis

In the multivariable logistic regression analysis, age was independently associated with seborrheic dermatitis. Participants aged 18–37 years had a significantly higher likelihood of developing seborrheic dermatitis compared with those aged >58 years (AOR = 1.75, 95% CI: 1.10–2.79,  $p = 0.018$ ). Similarly, individuals aged 38–57 years demonstrated a markedly increased risk of seborrheic dermatitis (AOR = 9.16, 95% CI: 1.13–10.50,  $p = 0.038$ ). Regarding occupational status, being employed was found to be protective against seborrheic dermatitis. Employed participants had 43% lower odds of having seborrheic dermatitis compared with unemployed individuals (AOR = 0.57, 95% CI: 0.35–0.93,  $p = 0.025$ ). Alcohol consumption was also significantly associated with seborrheic dermatitis. Participants who reported alcohol drinking had more than threefold increased odds of developing seborrheic dermatitis compared with non-drinkers (AOR = 3.29, 95% CI: 1.19–9.10,  $p = 0.022$ ). Although smoking showed a significant association in the bivariable analysis, this association did not remain statistically significant after adjustment for potential confounders in the multivariable model (AOR = 2.43, 95% CI: 0.82–7.23,  $p = 0.11$ ) (Table 4).

**Table 4:** Bivariable and multivariable logistic regression analysis showing factors associated with seborrheic dermatitis, at St Paul Millennium Medical College, of dermatology OPD unit, Addis Ababa, Ethiopia, from July 1, 2025, to December 30, 2025 (n=378).

| Variable   | seborrheic dermatitis |        | Bivariate analysis |       | Multivariate analysis |        |
|------------|-----------------------|--------|--------------------|-------|-----------------------|--------|
|            |                       |        | OR (95% CI)        |       |                       |        |
|            | Present               | Absent | Crud               | P     | Adjusted OR           | P      |
| Age        |                       |        |                    |       |                       |        |
| 18-37      | 65                    | 118    | 1.70(1.1,2.7)      | 0.022 | 1.75(1.10,2.79)       | 0.018* |
| 38-57      | 44                    | 136    | 7.71(0.91,9.7)     | 0.05  | 9.16(1.13,10.5)       | 0.038* |
| ≥58        | 01                    | 14     | 1.00 (Ref.)        |       |                       |        |
| Employment |                       |        |                    |       |                       |        |
| Employed   | 71                    | 204    | 0.57(0.35,0.92)    | 0.022 | 0.57(0.35,0.93)       | 0.025* |
| Unemployed | 39                    | 64     | 1.00 (Ref.)        |       |                       |        |
| Smoking    |                       |        |                    |       |                       |        |
| Yes        | 05                    | 105    | 12.8(1.48,16.87)   | 0.021 | 2.43(0.82,7.23)       | 0.11   |
| No         | 01                    | 267    | 1.00 (Ref.)        |       |                       |        |

| <b>Alcohol drinking</b> |    |     |                    |             |                 |               |
|-------------------------|----|-----|--------------------|-------------|-----------------|---------------|
| Yes                     | 09 | 101 | 2.89(1.1,7.71)     | <b>0.03</b> | 3.29(1.19,9.10) | <b>0.022*</b> |
| No                      | 08 | 260 | <b>1.00 (Ref.)</b> |             |                 |               |

\*p<0.05

## 6. Discussion

In the present study, 29.1% of the study participants were diagnosed with SD. This prevalence is higher than that reported in a systematic review(4.38%)[13], as well as studies conducted Turkey (5.2%), [54], Saudi Arabia(6%)[31], and Brazil and Netherlands (11%)[7, 41]. However, the prevalence observed in this study is lower than that reported in an Indian study, where SD affected 71% of participants[56]. This difference is likely attributable to the hospital-based dermatology clinic setting, where patients are more likely to present with symptomatic or chronic skin conditions. Additionally, variations in environmental factors, lifestyle behaviors, healthcare access, and diagnostic practices may further contribute to differences in prevalence across regions.

Findings in the literature regarding the risk factors associated with SD have been advocated, with controversial results, such as male sex, age, obesity, skin phototype, education, hypertension, depression, stress, and diet [57]. In this study, age showed a strong association with seborrheic dermatitis, with participants aged 18–37 years and 38–57 years. This observation is in line with previous studies reporting the prevalence increase adulthood [58]. Additionally, studies conducted in Canada and Indonesia have shown that seborrheic dermatitis is more common in adolescents and young adults [1, 59]. These age-related trends may be explained by increased sebaceous gland activity, higher androgen levels, and greater colonization with *Malassezia* species during these periods, which increase susceptibility to seborrheic dermatitis.

In this study, employed participants were significantly less likely to have seborrheic dermatitis compared with unemployed individuals ( $p = 0.022$ ). While this association is statistically significant, it does not necessarily imply a causal relationship. Being Employer may develop SD through multiple pathways, including psychosocial stress [59]. Moreover, unemployed individuals may experience higher levels of psychological stress, social isolation, and financial insecurity, all of which can contribute to systemic inflammation and a heightened risk of dermatological conditions[60]. These findings are consistent with previous epidemiological studies that reported an inverse relationship between employment and the prevalence of seborrheic dermatitis, suggesting that socioeconomic and occupational factors may play a role in disease susceptibility [1]. Alcohol intake showed a significant association with seborrheic dermatitis in our study. This finding aligns with previous reports in francs [57]

Previous studies have reported that Atopic dermatitis (AD) is a chronic inflammatory skin condition characterized by pruritus, erythema, induration, and scaling, which can be complicated by or mimic other dermatological conditions, including seborrheic dermatitis (SD) [8, 61]. The coexistence of AD and SD has been reported in clinical cases, presenting diagnostic challenges due to overlapping clinical manifestations[61, 62] . However, in the present study, atopic dermatitis was not found to be significantly associated with seborrheic dermatitis. This discrepancy may be attributed to differences in study design, sample size, and the cutoff values used to define atopic dermatitis. Furthermore, variations in study populations, diagnostic criteria, and the influence of unmeasured confounding factors may have contributed to the observed differences.

Similarly, although metabolic disease like DM has been identified as a significant association with seborrheic dermatitis in previous studies[63-66], it was not significantly associated with seborrheic dermatitis in the current study. This lack of association may be explained by differences in the distribution of comorbidities, glycemic control status, or statistical power to detect such associations.

A diet high in simple carbohydrates, daily intake of leafy greens, non-acidic fruits, nuts, and coffee, as well as using butter for frying and higher visible meat fat consumption, were all associated with increased prevalence of seborrheic dermatitis (SD)[19, 66].However, diet related variables are not statistically significant in our study. This lack of association may be explained by differences in study design, sample size, dietary assessment methods, or population characteristics.

## **Strength and limitations of the study**

Despite the strengths of this study, several limitations should be acknowledged. First, the study employed a cross-sectional design, capturing data at a single point in time. This inherently limits our ability to establish causal relationships or to observe changes in seborrheic dermatitis (SD) prevalence and associated factors over time. Consequently, longitudinal or multicenter studies are recommended to validate and expand upon our findings with a larger and more diverse study population. Second, our study exclusively focused on adult dermatology patients. Therefore, the results may not be generalizable to pediatric populations, who may exhibit different prevalence patterns or risk factors for SD.

Additionally, important information regarding participants' quality of life, severity of SD and the impact of SD on daily activities or work performance was not collected. This limitation raises the possibility of residual confounding, as certain relevant variables may have been unaccounted for. Nevertheless, a key strength of this study is that it addresses a significant gap in the literature, as no prior research has systematically investigated the prevalence of SD and its associated factors in Ethiopia, providing valuable baseline data for future studies and public health interventions.

## **7. Conclusions**

The present study highlighted that 29.1 % of the study participants were affected by seborrheic dermatitis (SD). Seborrheic dermatitis was relatively common among dermatology patients attending St. Paul's Millennium Medical College. Younger age and alcohol drinking were identified as significant risk factors, while being employed appeared to reduce the likelihood of developing the condition. The scalp was the most frequently affected area, and itching was the predominant symptom. These findings highlight the need for early identification of high-risk patients and targeted preventive and management strategies to reduce the burden of seborrheic dermatitis in the study population.

## **8. Recommendations**

Based on the findings of this study, it is recommended that healthcare providers give special attention to the early identification and management of seborrheic dermatitis, particularly among younger patients and those who drinking, as these groups were found to be at higher risk. Public health initiatives should focus on raising awareness about the condition, its triggers, and preventive measures, including lifestyle modifications such as alcohol cessation, proper skin care, and avoidance of aggravating factors. Dermatology clinics should consider implementing targeted interventions and follow-up programs for high-risk patients to monitor disease progression and improve treatment outcomes. Furthermore, policymakers and researchers are encouraged to conduct additional studies to explore other socio-demographic, environmental, and lifestyle factors that may contribute to seborrheic dermatitis in the Ethiopian context, which could inform evidence-based strategies for prevention and management. Overall, a coordinated approach involving patients, healthcare providers, and public health programs is essential to reduce the burden of seborrheic dermatitis and enhance the quality of life for affected individuals.

Future research is recommended to explore additional socio-demographic, environmental, and lifestyle factors that may influence the occurrence and severity of seborrheic dermatitis. Longitudinal studies could provide a better understanding of causal relationships and the progression of the disease over time. It would also be valuable to investigate the effectiveness of specific preventive measures, treatment strategies, and public health interventions in reducing the burden of seborrheic dermatitis. Additionally, studies involving larger and more diverse populations across different regions of Ethiopia could help generalize the findings and inform national-level strategies for the prevention and management of this condition.

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## **ANNEX 1: PARTICIPANT INFORMATION SHEET AND CONSENT**

### **Greeting**

Hello, my name is Fikirte Wolde a year 2 dermatovenerology Resident at SPHMMC; I am going to do research on Prevalence of SD among adult patients at SPHMMC. I would like to ask you a few questions regarding SD. The interview would take 15-20 minutes of your time. This will help to know the magnitude and associated factors towards SD disease. Your participation is completely voluntary. You can refuse to answer any questions and/or withdraw from the study at any time without a problem to you. All your responses will remain strictly confidential: your name will not appear on the interview guide (will not be recorded), and your responses will not be linked to your identity at any time. Do I have your permission to continue?

If Yes, Continue to the Next Page

If No, Skip to the next Respondent

Questionnaire number \_\_\_\_\_

Date of interview (Day/Month/Year) \_\_\_\_\_

### **Purpose of the study:**

The study aims to assess prevalence and associated factors of SD patients at SPMMHC Hospital, in Addis Ababa. By conducting this research, we seek to assess prevalence and associated factors of SD patients.

### **Description of the study procedures**

As a participant in this study, you will be asked to respond to a structured questionnaire through face-to-face interview. The questionnaire is designed to gather information about socio-demographic characteristics, clinical characteristics and dietary characteristics, and physical activity experiences. The participation in this study is voluntary and expected to take 30 minutes to complete. Your input is crucial in helping us understanding of SD prevalence and associated factors in SPHMMC hospital, Addis Ababa.

### **Risk of the study**

There is minor inconvenience or time commitment in completing the questionnaire.

**Benefits of being in this study**

By participate in this study there is no direct benefit or no payments associated with participating in this study. But you will contribute to advancing evidence towards SD prevalence and associated factors.

**Confidentiality**

Your participation in this study will be kept confidential. Your personal information will not be given to other party without your consent. All collected data will be stored securely and only accessible with authorized person.

**Right to refuse or withdraw**

Your participation in this study is voluntary. Participants can stop from participation at any time without penalty or consequences. You have the right to skip question which does not want to respond. Your decision will not affect the services that you get from the hospital.

**Right to ask questions and report concerns**

Participants can ask any questions which is not clear for understanding at any time. If you have any questions or concerns about the research, you can contact Fikirte wolde (MD) by mobile number 09114777955. Additionally, you will be provided with a summary of the study results up on request.

**Consent**

I have read all this form or it has been read to me in the language I comprehend and understood all conditions stated above. I have been well informed that the data collection is anonymous and unique identifier will be used. I fully understand that I can participate in the study voluntarily and can refuse or withdraw anytime. I certify that I have read and understood all the information in this consent form, including the nature and purpose, the potential benefit and, possible risk associated with participating in this study.

By signing below, I voluntarily agree to participate in this research study.

Respondent's name: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_

Investigator's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

☐Completed   ☐Refused   ☐Respondent not available   ☐partially complete

**ANNEX 2: QUESTIONNAIRE**

| Part I Sociodemographic characteristic of patients. |                    |                                                                                                              |
|-----------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------|
| No                                                  | Variable           | Response                                                                                                     |
| 1                                                   | Age in years       |                                                                                                              |
| 2                                                   | Sex                | 1. Male<br>2. Female                                                                                         |
| 3                                                   | Marital status     | 1. Married<br>2. Single<br>3. Divorced<br>4. Widowed                                                         |
| 4                                                   | Occupation         | 1. Governmental employee<br>2. Merchant<br>3. Farmer<br>4. Student<br>5. Housewife<br>6. Other, specify_____ |
| 5                                                   | Religion           | 1. Orthodox<br>2. Muslims<br>3. Protestant<br>4. other                                                       |
| 6                                                   | Educational status | 1. Illiterate<br>2. primary<br>3. secondary<br>4. higher education                                           |
| 7                                                   | Monthly income     | Birr _____                                                                                                   |
| 8                                                   | Residency area     | 1. Urban<br>2. Rural                                                                                         |

| <b>Part II: Clinical characteristics of patients</b> |                                     |                                                                      |
|------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------|
| 1                                                    | Does the patient have SD?           | 1. Yes<br>2. No                                                      |
| 2                                                    | If yes, disease duration in years   |                                                                      |
| 3                                                    | Site of SD involvement              | 1. Face<br>2. Head (Scalp)<br>3. Groin area<br>4. Other              |
| 4                                                    | Associated symptoms with the lesion | 1. No<br>2. Itching<br>3. burning sensation<br>4. other              |
| 5                                                    | Skin type                           | 1. Normal<br>2. Oily<br>3. Dry<br>4. Combination                     |
| 6                                                    | Family history of SD                | 1. Yes<br>2. No                                                      |
| 7                                                    | If Concurrent skin disease          | 1. Yes<br>2. No                                                      |
| 8                                                    | What is the concurrent disease?     | 1. Psoriasis<br>2. Atopic dermatitis<br>3. Tinea capitis<br>4. Other |
| 9                                                    | Co-morbidity                        | 1. Yes<br>2. No                                                      |
| 10                                                   | What is the comorbid disease        | 1. HIV<br>2. DM<br>3. Dyslipidemia<br>4. Other                       |
| 11                                                   | Stress level                        | 1. Normal<br>2. Abnormal                                             |

|                                                                                         |                                                  |                                                                          |
|-----------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------|
| 12                                                                                      | Any medication taken                             | 1. Yes<br>2. No                                                          |
| 13                                                                                      | Which medication                                 | 1. Griseofulvin<br>2. steroid<br>3. Lithium<br>4. Interferon<br>5. Other |
| 14                                                                                      | Any aggravating factors                          | 1. Yes<br>2. No                                                          |
| 15                                                                                      | What is the aggravating factor                   | 1. Cosmetic use<br>2. Sun exposure<br>3. Low humidity<br>4. Other        |
| Part III: Dietary and physical activity experiences of patients (life style associated) |                                                  |                                                                          |
| 1                                                                                       | Daily dietary practices                          | 1. Western diet<br>2. Vegetable diet<br>3. Mixed<br>4. Other             |
| 2                                                                                       | How frequently do you eat vegetables and fruits? | 1. Rarely<br>2. Sometimes<br>3. Usually,                                 |
| 3                                                                                       | How frequently do you exercise?                  | 1. Rarely<br>2. Sometimes<br>3. Usually                                  |
| 4                                                                                       | How much daily sunlight exposure do you have     | 1. A little<br>2. Some<br>3. A lot                                       |
| 5                                                                                       | Do you smoke?                                    | 1. Yes<br>2. No                                                          |
| 6                                                                                       | Do you drink alcohol?                            | 1. Yes<br>2. No                                                          |
| 7                                                                                       | Do you chew khat?                                | 1. Yes<br>2. No                                                          |

Thank you!

