

## Melasma and Associated Factors in Arar City, Kingdom of Saudi Arabia (KSA)

DINA ANWAR A ALJABER<sup>2</sup> REHAB ABDALLAH A ALANAZI<sup>2</sup>  
NAGAH MOHAMED ABO EL-FETOH<sup>1</sup> NESREEN A. MOHAMMED<sup>1</sup>  
HADIL ANWAR A ALJABER<sup>3</sup> FATIMAH FAHAD S ALTALEB<sup>2</sup>  
HALA MOHAMMED H ALANAZI<sup>2</sup> HAIFA LAFI ALENZI<sup>3</sup>

1.ASSOCIATE PROFESSOR, COMMUNITY MEDICINE DEPARTMENT, FACULTY OF MEDICINE,  
NORTHERN BORDER UNIVERSITY , ARAR , KSA

2.Intern , FACULTY OF MEDICINE , NORTHERN BORDER UNIVERSITY

3.Students, FACULTY OF MEDICINE , NORTHERN BORDER UNIVERSITY

### Abstract

Melasma is a common dermatological disorder characterized by irregular brownish patches with unclear etiology and a variety of factors may be associated with its occurrence. Melasma patients suffer significant emotional and psychological problems making assessment of their quality of life is increasingly necessary. **Aim of the study:** This study was conducted to identify the frequency and factors associated with occurrence of Melasma in Arar, KSA and its effect on some determinant of quality of life in the affected patients. **Subjects and methods:** A population based cross sectional study was conducted from January 2016 to January 2017. It included 470 individuals attended five randomly selected primary healthcare centers in Arar city in the Northern Province of Kingdom of Saudi Arabia and were selected by systemic random sampling. Data were collected by means of personal interview with the sampled population using a predesigned questionnaire. **Results:** Findings revealed that 18.7 % of the studied population suffered from Melasma. Age and positive family history were significantly associated with the development of Melasma among the studied patients while gender, skin color, sun exposure and cosmetic use had no significant effect. Most of the studied determinants of quality of life were not affected by suffering from Melasma while lack of self-confidence was significantly associated with the presence of Melasma. **Conclusion:** less than one fifth (18.7%) of the studied patients suffered from Melasma. Age and positive family history are the most common associations. Melasma had a significant impact on self-confidence of the affected patients.

**Keywords:** Melasma, risk factor, quality of life.

### Introduction

Skin is considered the largest organ of the body and its integrity and normal healthy appearance are essential for the positive body image and play a vital role in attractiveness, self-confidence and social interactions. Patients with dermatological disorders suffer from emotional pain<sup>[1]</sup>, moreover, those patients are more prone to psychiatric disorders (30-60%)<sup>[2]</sup> and most of them can develop depressive symptoms<sup>[3]</sup>. Among these skin disorders, pigmentary disorders such as Melasma, which adversely affects quality of life<sup>[4]</sup>.

The origin of the word Melasma was from the Greek root "melas", which stands for black, and refers to discoloration by which Melasma patients present clinically<sup>[5]</sup>. Melasma is a common dermatological disorder characterized by irregular brownish patches on the face. with unclear etiology. Even though, a variety of factors may be associated with Melasma. Among these factors, ultraviolet light exposure and genetic influences are the main predictors of the development of the disease<sup>[6]</sup>.

Other factors include hormonal changes of pregnancy, oral contraceptive pills, hormonal treatment, thyroid autoimmune diseases, the use of cosmetics, and some drugs<sup>[6, 7]</sup>. Regarding gender relation with Melasma, 90% of Melasma patients are females, the clinical manifestations are the same in both males and females<sup>[8, 9]</sup>.

The prevalence of Melasma shows significant variations geographically. It usually occurs in darker skin types and less frequent in fair or very dark skin. Melasma may develop in any population but the most affected are those of East Asian, Indian, Pakistani, Middle Eastern and Mediterranean-African, Hispanic-American and Brazilian origin<sup>[5]</sup>.

Melasma diagnosis is mainly clinical as patients usually present with gradual-onset areas of discoloration mainly on the face and is usually bilateral. The lesions are usually symmetrical. The skin discoloration varies from tan to brown but may be black or bluish tinged<sup>[9]</sup>.

The chronic nature of the disease and its common recurrences make its management is challenging so the disease is often difficult to be treated<sup>[10]</sup>. Therefore, Melasma patients suffer significant emotional and psychological problems<sup>[11]</sup> and their self-perception, self-esteem, social and professional activities are inversely affected<sup>[4, 12]</sup> making assessment of their quality of life is increasingly necessary<sup>[13]</sup>.

So, this study was conducted to identify the frequency and factors associated with the occurrence of Melasma among patients attending five randomly selected primary healthcare centers in Arar city in the

Northern Province of Kingdom of Saudi Arabia and its effect on some determinant of quality of life in the affected patients.

## Subjects and Methods

### Study design and setting

The current study is a population based cross sectional study carried out in Arar city in the Northern Province of Kingdom of Saudi Arabia, during the period from January 2016 to January 2017.

### Study participants

A total of 470 individuals (276 males and 194 females) attended five randomly selected primary healthcare centers in Arar city in the Northern Province of Kingdom of Saudi Arabia were included in the study. The selected centers were reviewed regularly during the study period and the participants were selected by systemic random sampling procedure and included in the study after taking an informed consent. Each person was interviewed separately, and confidentiality was assured. Health centers provide healthy and sick persons with healthcare services in an acceptable atmosphere of both privacy and confidentiality. Such an environment is ideal to conduct a study on skin disease like Melasma.

Exclusion criteria included patients who refused to participate in the study and emotionally unstable persons.

### Data Collection Method

Data were collected by means of personal interview with the sampled population using a predesigned questionnaire covering the following items:

- (1) Socio-demographic characteristics, including age, sex and educational status.
- (2) Suffering from Melasma, and some potentially related factors including skin color, family history, exposure to sunlight and using of cosmetics.
- (3) The effect of Melasma on some determinants of quality of life such as the effect on social communication and participation, self-confidence, marital desire or marital relation, learning, work and success, social relations, sense of fearing of people from infection, causing economic problems.

### Ethical consideration

This study was reviewed and approved by the Research Ethics Committee of Faculty of Medicine, Northern Border University. Participants were informed that participation is completely voluntary, and a written consent was obtained from each participant before being subjected to the questionnaire and after discussing the objective with the participants. The questionnaires used in data collection were anonymous and all questionnaires were kept safe and confidentiality of data was assured.

### The statistical analysis

The statistical analysis was carried out using SPSS software for Windows (version 15.0). Sample characteristics were summarized as numbers and percentages for categorical variables. Chi-Square test was used for comparing qualitative variables. A 5% level was chosen as a level of statistical significance in all statistical tests used in the study.

## Results

The current study included 470 participants attended the five randomly selected primary healthcare centers in Arar, KSA, during the study period and accepted to participate in the study. Male were more than females (58.7% Vs 41.3%). About one-third of the individuals participating in the study (32.3%) were less than 20 years of age, 29.8% were between 20 and 30 years of age, 9.8% were between 40 and 50 years of age and only 4.3% were more than 50 years. As regards the educational status of the participants, more than half of them (59.6%) had completed secondary education, about one-third had completed their primary or preparatory education, 32.3% were university graduates and only 4.7% were illiterate. (**table 1**).

As illustrated by **Figure 1**, 18.7 % of the participants were suffering from Melasma and 81.3% were free.

**Table (2)** describes the relationship between suffering from Melasma and some sociodemographic variables of the studied population. As shown by the presented data, participants in the age group (30 – 40 years) represented more than one third (34.1%) of those who were affected with Melasma, 20.5% of Melasma patients were in the age group (20-30 years), those who were younger than 20 years old represented 15.9% of Melasma patients and patients aged  $\geq 50$  years old represented 11.4% of them and this difference was statistically significant (P-value = 0.001). Males were more likely to be suffering from Melasma (56.8%) compared with females (43.2%), with a statistically insignificant difference (P-value = 0.45). University graduates represented more than half (54.5%) of Melasma patients compared with primary or preparatory (29.5%), and uneducated (15.9%) population, while secondary educated showed no affection with Melasma, with a statistically significant

difference (P-value = 0.01)

As shown in **table (3)**, half of Melasma patients (50%) had corny skin, while participants with white colored and dark colored skin were less likely to be affected (27.3%, 22.7% respectively) and this difference was statistically insignificant (P-value = 0.65). Family history of Melasma was significantly associated with the development of Melasma where 61.4% of Melasma patients participated in the current study had positive family history while about one third of them (31.8%) had negative family history (P-value = 0.000). Although 47.7% of Melasma patients were more likely to be exposed to sunlight compared to 31.9% who were not exposed, no significant association between exposure to sunlight and suffering from Melasma was found (P-value = 0.134). As regards cosmetics using, 22.7% of Melasma patients were using cosmetics compared to 16.8% of participants who were free and the difference was statistically insignificant (P-value = 0.355).

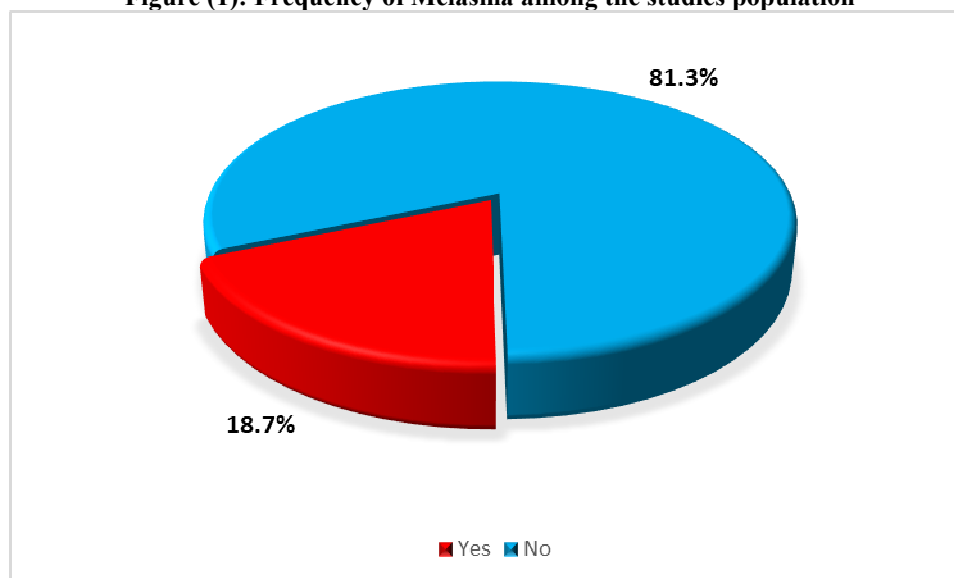
**Table (4)** shows some studied determinants of quality of life in the studied population. One quarter (25 %) of Melasma patients reported that the disease affected their social communication and participation compared to 19.4% of participants who were free of Melasma and their social communication was affected by other factors (P-value= 0.706). Moreover, suffering from Melasma had no significant effect on marital or social relations, people fear from infection, learning, work and economic status. On the other hand, Melasma significantly impacted self-confidence in the affected patients as about half (47.7%) of Melasma patients reported lack of self-confidence compared to 38.2% of participants who were not suffering from Melasma (P-value = 0.033).

There was no significant difference (P-value = 0.319) between the studied Melasma patients and participants who were free from the disease regarding the reported need for health education programs about Melasma (**figure 2**).

**Table (1):Sex, age and educational level of the studied population in Arar, KSA(n = 470)**

Parameter	No.	%
<b>Sex</b>		
Male	276	58.7
Female	194	41.3
<b>Age (Mean±SD, minimum, maximum and range 28.8±11.3, 14, 68 and 54)</b>		
< 20 years	152	32.3
20 -	140	29.8
30 -	112	23.8
40 -	46	9.8
50 years or more	20	4.3
<b>Educational level</b>		
University or more	152	32.3
Secondary	280	59.6
Primary or preparatory	152	32.3
Illiterate	22	4.7

**Figure (1): Frequency of Melasma among the studies population**



**Table (2): age groups, sex and educational level of the studied population (with and without hyper-pigmentation) in Arar, KSA**

	Melasma		Total (n=470)	P-value
	Yes (n=88)	No (n=382)		
<b>Age</b>				
< 20 years	14(15.9%)	138(36.1%)	152(32.3%)	<b>0.001</b>
20 -	18(20.5%)	122(31.9%)	140(29.8%)	
30 -	30(34.1%)	82(21.5%)	112(23.8%)	
40 -	16(18.2%)	30(7.9%)	64(9.8%)	
50 years or more	10(11.4%)	10(2.6%)	20(4.3%)	
<b>Sex</b>				
Male	50(56.8%)	226(59.2%)	270(58.7%)	0.452
Female	38(43.2%)	156(40.8%)	194(41.3%)	
<b>Educational level</b>				
University or more	48(54.5%)	232(60.7%)	280(59.6%)	<b>0.001</b>
Secondary	0(0.0%)	16(4.2%)	16(3.4%)	
Primary or preparatory	26(29.5%)	126(33.0%)	152(32.3%)	
Illiterate	14(15.9%)	8(2.1%)	22(4.7%)	

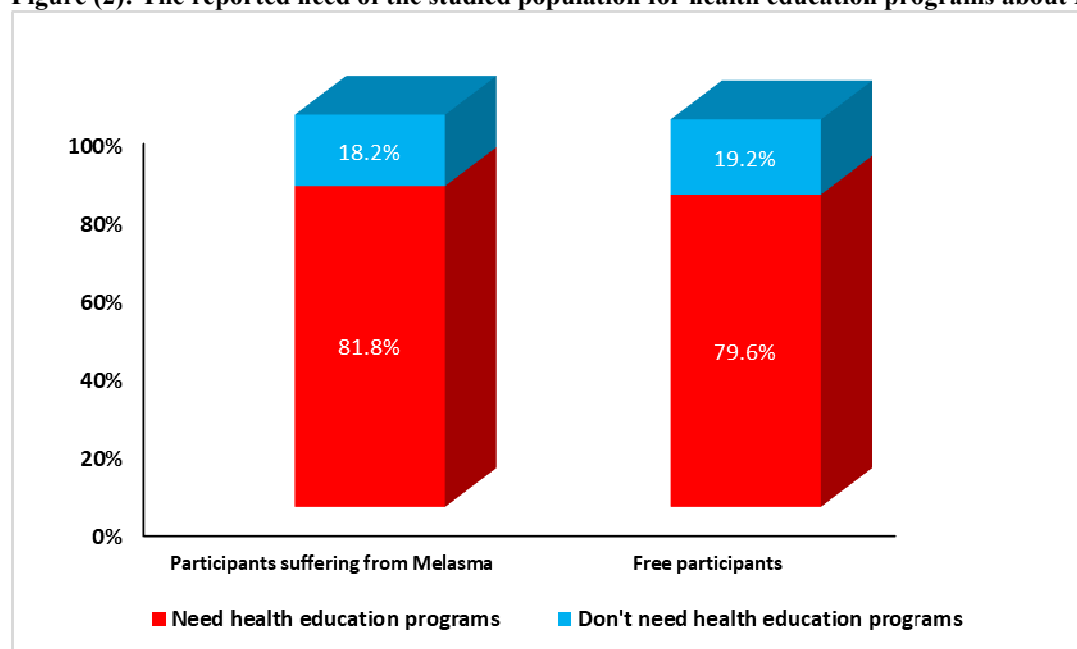
**Table (3): Possible related factors in the studied population (with and without Melasma) in Arar, KSA**

	Melasma		Total (n=470)	P- value
	Yes (n=88)	No (n=382)		
<b>Skin color</b>				
White	24(27.3%)	122(31.9%)	146(31.1%)	0.656
Dark	20(22.7%)	98(25.7%)	118(25.1%)	
Corny	44(50.0%)	162(42.4%)	206(43.8%)	
<b>Family history</b>				
Yes	54(61.4%)	90(23.6%)	144(30.6%)	<b>0.000</b>
No	28(31.8%)	266(69.6%)	294(62.6%)	
Don't know	6(6.8%)	26(6.8%)	32(6.8%)	
<b>Exposure to sunlight</b>				
Yes	42(47.7%)	122(31.9%)	164(34.9%)	0.134
No	18(20.5%)	92(24.1%)	110(23.4%)	
Sometimes	28(31.8%)	168(44.0%)	196(41.7%)	
<b>Using of cosmetics</b>				
Yes	20(22.7%)	64(16.8%)	84(17.9%)	0.355
No	38(43.2%)	210(55.0%)	248(52.8%)	
Sometimes	30(34.1%)	108(28.3%)	138(29.4%)	

**Table (4): Studied quality of lifedeterminants in the studied population (with and without Melasma) in Arar, KSA**

	Melasma		Total (n=470)	P-value
	Yes (n=88)	No (n=382)		
<b>Effect on social communication and participation</b>				
Yes	22(25.0%)	74(19.4%)	96(20.4%)	0.706
No	44(50.0%)	206(53.9%)	250(53.2%)	
Sometimes	22(25.0%)	102(26.7%)	124(26.4%)	
<b>Effect on self confidence</b>				
Yes	42(47.7%)	146(38.2%)	188(40.0%)	<b>0.033</b>
No	34(38.6%)	108(28.3%)	142(30.2%)	
Sometimes	12(13.6%)	128(33.5%)	140(29.8%)	
<b>Effect on marital desire or marital relation</b>				
Yes	30(34.1%)	88(23.0%)	118(25.1%)	0.221
No	42(47.7%)	188(49.2%)	230(48.9%)	
Sometimes	16(18.2%)	106(27.7%)	122(26.0%)	
<b>Effect on learning, work and success</b>				
Yes	14(15.9%)	48(12.6%)	62(13.2%)	0.487
No	66(75.0%)	274(71.7%)	340(72.3%)	
Sometimes	8(9.1%)	60(15.7%)	68(14.5%)	
<b>Effect on social relations</b>				
Yes	18(20.5%)	66(17.3%)	84(17.9%)	0.847
No	44(50.0%)	190(49.7%)	234(49.8%)	
Sometimes	26(29.5%)	126(33.0%)	152(32.3%)	
<b>People sense of fearing from infection</b>				
Yes	10(11.4%)	48(12.6%)	58(12.3%)	0.632
No	68(77.3%)	270(70.7%)	338(71.9%)	
Sometimes	10(11.4%)	64(16.8%)	74(15.7%)	
<b>Economic problems</b>				
Yes	34(38.6%)	166(43.5%)	200(42.6%)	0.812
No	20(22.7%)	74(19.4%)	94(20.0%)	
Sometimes	34(38.6%)	142(37.2%)	176(37.4%)	

**Figure (2): The reported need of the studied population for health education programs about Melasma.**



## Discussion

Melasma is an acquired pigmentary disorder of the face or neck. The disease is more common among women of reproductive age and adversely impacts emotional and psychologic status of the affected patients and their quality of life <sup>[14]</sup>.

The current study included 470 participants attended the five randomly selected primary healthcare centers in Arar, KSA, during the study period and revealed that 18.7 % of the participants were suffering from Melasma and 81.3% were free. These findings were higher than what was outlined by <sup>[15]</sup> in a survey conducted in Brazil where melanodermias (including, Melasma) represented 8.4% of all complaints. Moreover, A survey conducted in an Arab population resident in Detroit (USA), revealed that 14.5% of the sample had Melasma<sup>[16]</sup>.

Another study carried out in France found that the prevalence of Melasma in a group of 60 pregnant women was 5 %. A possible explanation for these differences between the studies could be the difference in skin types, confirming the assumption that Melasma is more frequent in darker skin types<sup>[17]</sup>.

Regarding sociodemographic variables association with the development of Melasma, there was a significant difference between age groups regards suffering from Melasma where participants in the age group (30 – 40years) represented 34.1% of patients affected with Melasma, 20.5% of Melasma patients were in the age group (20-30 years), patients who were 40 -50 years old represented 18.2%of participants. These proportions were close to the findings reported by <sup>[18]</sup>and revealed that Melasma is frequent among middle-aged females as the majority of Melasma patients were in the 31–40 years age group (44%), followed by 21–30 years (26.9%) and 41–50years (16.6%) age groups. On the other hand, a study conducted by <sup>[19]</sup> concluded that age had no significant effect on suffering from Melasma.

There was no significant difference between males and females concerning the rate of the disease which is inconsistent with the findings of a study conducted in India, and noted a great discrepancy between men and women as among 120 patients with Melasma, 25.8% were men <sup>[20]</sup>.

Findings of the current study illustrated that half of Melasma patients (50%) had corny skin, while participants with white colored and dark colored skin were less likely to be affected (27.3%, 22.7% respectively) with no significant association between skin type and suffering from Melasma. On contrary to these results, a study conducted at the University Hospital of the Universidade Federal de Santa Catarina, Brazil by <sup>[9]</sup>found that Melasma is more frequent in fair skinned individuals (73.9%).

Family history was found to have a highly significant effect (P-value=0.000) on developing Melasma among the participants of the current study as 61.4% of Melasma patients had positive family history. This proportion is higher than what was reported by <sup>[9]</sup> where 49.02% of the studied population had a familial history of Melasma with no significant association with Melasma development. Another study conducted in a private medical center in Anuradhapura by <sup>[21]</sup> reported that only 27% of the studied Melasma patients had family history of similar lesions and in the study conducted by<sup>[18]</sup>, 54.85% of the participants in their study reported a positive family history.

No significant association between exposure to sunlight and cosmetics using and suffering from Melasma in the current study where 47.7% of Melasma patients were more likely to be exposed to sunlight and 22.7% of Melasma patients were using cosmetics. These findings are nearly similar to the findings of <sup>[18]</sup>who revealed that exposure to sunlight was reported by 48.5% of Melasma patients andwas considered as major contributing factor followed by cosmetics (22.2%). Another study conducted by <sup>[22]</sup> found that 21%of Melasma patients used cosmetics regularly for at least5days/week and in a study conducted by <sup>[23]</sup>44.3% of Melasma patients had a sun exposure of more than 4 hours.

Regarding the effect of Melasma on certain determinants of quality of life in the studied population. The current study concluded that 25 % of Melasma patients reported that the disease affected their social communication which is much lower than the findings of the study carried out by <sup>[23]</sup>and found that at least 65.1% of the participants reported that their skin condition affected their relations and communication with other people.

According to the findings of the current study, Melasma significantly impacted self-confidence in the affected patients as 47.7% of Melasma patients reported lack of self-confidence (P-value = 0.033). These findings are not in line with the findings of <sup>[24]</sup> who reported that there was no significant association between suffering of Melasma and self-confidence problems

Melasma had no significant effect on other inquired aspects of quality of life like marital or social relations, people fear from infection, learning, work and economic status. In contrast, <sup>[25]</sup>concluded that Melasma in the studied women affected quality of life adversely and <sup>[24]</sup> another study was carried out in China and revealed skin discoloration significantly affected health-related quality of life and inversely impacted marital relationships (3). In addition, a study conducted by <sup>[26]</sup> concluded that Melasma resulted in a deleterious effect on patients' quality of life with greater impairment of life quality in females compared to male patients with severe disease.



### Study limitations:

Causality cannot be tested in the present study because it was conducted as a cross-sectional survey.

### Conclusion

The current study revealed that less than one fifth (18.7%) of the studied patients suffered from Melasma. Age and positive family history were significantly associated with the development of Melasma among the studied patients while gender, skin color, sun exposure and cosmetic use had no significant effect. In addition, there was a statistically significant difference between educational level groups of the studied patients regarding suffering from Melasma.

Most of the studied determinants of quality of life were not affected by suffering from Melasma among the studied population while affection of self-confidence was significantly associated with the presence of Melasma as about half (47.7%) of Melasma patients reported lack of self-confidence. .

**Conflict of Interest:** nil

**Source of Funding:** nil

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