

## Knowledge and Awareness about the Association Between Skin Aging and Smoking Among Najran City Residents, 2024.

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### Abstract:

**Background:** The potential harmful effects of smoking are not only affect internal organs, but may have great effects on skin age. **The aim** of this study was to assess the level of knowledge and awareness among Najran City, Saudi Arabia residents regarding the association between smoking and premature skin aging. **Methodology:** A cross-sectional and community-based study was conducted in Najran city.. A simple random sampling technique was used for determining the sample size. A semi-structured and self-administered an electronic questionnaire was utilized for collecting data. Data analysis was conducted using Microsoft Office Excel 2007 and version 21 of the Statistical Package for the Social Sciences. The Chi-square test was applied, with a significance level of  $P < 0.05$ . **Results:** A study conducted among 251 Najran city residents revealed that 70.9% of participants were male, while 29.1% were female. The majority (39.8%) were aged 20-24 years. 48.2% of participants were university graduates, and 40.2% completed high school. 45.4% were students. 80.9% were non-smokers. Among smokers, 10.8% were current smokers, with varying daily consumption levels. 68.9% were unaware of the link between smoking and wrinkles. 30.7% believed the effect was minimal, while 20.7% thought it had a severe impact. 72.1% expressed a desire to learn more about the relationship between smoking and skin aging, and 51.4% were willing to participate in educational activities related to this topic. 57.4% wanted to engage in activities to help them quit smoking. **Conclusion:** In conclusion, the study highlights a critical gap in awareness about the detrimental effects of smoking on skin health among Najran city residents, alongside a willingness to engage in educational programs. These findings underscore the need for targeted health education campaigns to inform the community about the risks associated with smoking and to encourage healthier lifestyle choices.

**Keywords:** smoking, skin aging, knowledge, awareness.

### Introduction:

Due to the recent trend toward wrinkles and a decline in skin quality, there has been growing interest in skin aging in all cultures, including Arabic. This trend has led to increased demand for medical treatments. To create good and effective medical treatments, it is necessary to prevent skin aging. Smoking is widely known to be a high-risk factor for skin aging<sup>1</sup>. Worldwide, smoking tobacco is the leading cause of preventable illness and causes over three million deaths annually. Smoking has a high correlation with several systemic disorders (Morita A., 2007). It is also linked to various dermatological conditions, such as

psoriasis, acne, squamous cell carcinoma, melanoma, premature skin aging, and hair loss<sup>2</sup>. The harmful consequences of smoking on the skin have long been known. According to epidemiological research, smoking contributes significantly to the environment and causes premature skin aging. According to in vitro research, tobacco smoke extract reduces collagen synthesis and enhances the synthesis of tropoelastin and matrix metalloproteinases (MMP), which break down matrix proteins. It also results in an aberrant elastosis material production (Morita A., 2007).

The entire body is negatively impacted by cigarette smoke, but the skin is particularly affected. Its nicotine content alters the

angiogenesis and skin microcirculation, as well as the keratinocytes' diversification into the epidermis. In parallel, smoking cigarettes accelerates the breakdown of elastic and collagen fibers, which comprise the skin's foundation. In this sense, it quickens the aging process (Urbanska et al., 2012).

It has been noted that the skin of forty-year-old junkies who smoke looks similar to the skin of seventy-year-old individuals who do not smoke. Tobacco smoke causes irreparable skin damage, which can be prevented by quitting smoking (Urbanska et al., 2012).

Precocious aging is the most common side effect of smoking and arguably the most upsetting to society. Prominent wrinkles, a gaunt face with a prominence of the underlying bone contours, an atrophic, gray aspect of the skin, and a plethoric complexion are all characteristics of a "smoker's face" (Ortiz, et al., 2012).

Although current smokers are less aware of the link between smoking and skin aging, almost 25% of them think knowing this information could make them decide to give up<sup>5</sup>. Public health research suggests that smokers generally do not know enough about how smoking affects skin aging. For example, a study carried out in Jeddah, Saudi Arabia, discovered that although over half of the participants knew that smoking causes skin aging, smokers who were now smoking knew the least about these consequences than people who were not smokers or had previously smoked (Ortiz, et al., 2020).

Although only 64% of the public accurately recognizes the link between smoking and skin aging, this information has no discernible impact on smokers' determination to stop<sup>6</sup>. Male students at Najran University consume little fruit and vegetables on a regular basis, smoke a lot, and engage in little physical activity despite being well aware of the health hazards associated with smoking (Al-Qahtani, 2022).

A. Morita et al. said that Smoking tobacco leads to accelerated skin aging, impairing collagen production and increasing

matrix metalloproteinases (MMP) levels (Morita A., 2007). M. Urbanska et al concluded that cigarette smoke causes unfavorable skin changes and quickens the natural process of skin aging, making the skin of smoking addicts at 40 years resemble skin of non-smoking 70-year-old adults (Urbańska, et al., 2012). Ernster et al, in the study of facial wrinkling in men and women, by smoking status; found that; current smokers have a greater risk of facial wrinkling compared to never smokers, with pack-years of smoking being positively associated with wrinkle score in women aged 40-69 and men aged 40-59 (Ernster et al., 1995).

Hefler et al mentioned that: While the focus on helping tobacco users become smoke-free and start down the path to better health is welcome, the tobacco industry receives exceptional treatment from governments in almost every nation. This is highlighted by the 2021 World No Tobacco Day (WNTD) theme and the year-long global campaign "Commit to Quit (Hefler et al., 2021)."

### Study objectives:

1. To determine the level of knowledge among Najran city residents about the association between smoking and premature skin aging.
2. To evaluate the awareness of Najran city residents regarding the specific skin-related effects of smoking.
3. To identify the demographic factors (e.g., age, gender, education level) that influence the knowledge and awareness about the link between smoking and skin aging in the Najran city population.
4. To explore the willingness and motivations of Najran city smokers to quit smoking to prevent or reverse the detrimental effects of smoking on their skin.

### Materials and Methods

#### Study area and population

The current study was conducted in Najran city in the southeast of Saudi Arabia.

Najran city is specifically located along the border with Yemen. It is worth noting that the total population of Najran was determined to be 592,300 individuals according to the most recent census conducted in 2017 by the Saudi General Authority for Statistics (SGAS).

### Sampling and Data collection process

After consenting to the study, participants were provided with a link to an online

questionnaire via social media platforms (such as WhatsApp and Facebook). The link was only shared with eligible participants who met the inclusion criteria.

The research committee, at the Family and Community Medicine Department, at Najran University, approved this study.

The sample size was calculated using the following formula:

$$n = \frac{z^2 \times p \times (1-P)}{E^2} = 385$$

A pilot study was done on 20 participants and Cronbach's alpha was 0.7. The study questionnaire was composed of 13 questions. At the beginning of the questionnaire, brief information about the study's nature, the participant's role, and the gained information will remain confidential, if they agree they can proceed with the questionnaire. The study was conducted by using a simple random sampling distribution of a self-administered online questionnaire (Google Form questionnaire) to the general population of Najran city, through various social communication platforms (such as Telegram, WhatsApp, etc.).

### Data analysis

After cleaning and coding the data, the data analysis was performed using Microsoft Office Excel 2007 and version 21 of the Statistical Package for the Social Sciences. The Chi-square test was applied, with a significance level of  $P < 0.05$ .

### Results:

The distribution of participants to males and females in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents, 2024. Two hundred fifty-one participants responded to the study's google form, which had been distributed among Najran city residents. Among them 70.9% were males, and 29.1 % were females Table (1).

Table 2 shows the distribution of participants in regards to age in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents, 2024. Almost 39.8% of the participants were in the age range of 20–24 years, 27.9% were in the age range of 40 years and more, 13.1% were 35-39 years, 9.6 in the age range of 30-34 years, and 4.8% for both age range of 19 years and less and 25-29 years (Table2).

Table 3 shows the distribution of participants in regards to the level of education in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents, 2024. It appears that most participants graduated from university with a percentage of 48.2, and 40.2% completed the higher school level.

Distribution of participants in regards to their occupation in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents, 2024. Most of the participants were students with a percentage of 45.4%, then came employer (mozaf) with 16.7%, teacher with 13.5%, and unemployed (without work) 6.4%. Table (4)

As displayed in figure (1), most of the participants were non-smokers (80.9%), 10.8% were current smokers, and 8.3% were former smokers.

Table (5) shows the distribution of smokers and former smokers about smoking habits in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City

Residents, 2024. It appears that smoking habits for current smokers and former smokers showed that 8.3% of the participants smoke more than 20 cigars per day, 8.3% smoke 20 cigars per day, 11-15 cigars per day for about 14.6%, 6-10 cigars per day is for 29.3% of the participants, 2-5 cigars per day for 27%, and one cigar per day is 12.5%.

The response of 68.9% said (No) (77.5 % males, 22.5 % females) to their knowledge about the association between smoking and increased wrinkles, and 31.1% answered (Yes) (56.4 % males, 43.6 % females). 38.4 % of their knowledge is from media, 22% is from reading about the topic, 19.2% is gained from health programs, 10.2% from magazines and newspapers, 6.4% of knowledge is due to their jobs (doctors & medical students), 3.8% gained knowledge from other smokers. (Figure 2, Cross tabulation 1, & Figure 3)

As a response to the question on a scale of 5, what is your opinion about the effect of smoking on premature skin aging? 30.7% of participants answered that the effect is very minimal ( male 80.5%, female 19.5%), 27.1% said no impact( male 67.6%, female 32.4%), 20.7% ( male 71%, female 29%), said that it has a severe effect, mild to moderate effect, and minimum effect is 10.8% of the responses each of them. 80.5 % of the male respondents Figure (4) & Cross tabulation (2)

The participants' response to: do you want to know more about the relationship between smoking and skin aging? More than two-thirds of the participants are willing to know more about the relationship between smoking and skin aging (72.1%) (71.3 % males, 28.7% females) said (yes), 19.1% (68.8 % males, 31.2% females) said (No), and only 8.8% (72.7 % males, 27.3% females) answered (I do not know). Figure (5) & Cross tabulation (3)

As shows in figure (6) It appears that the participants responded to: Do you want to participate in educational activities, by attending or providing information on the relationship between smoking and premature skin aging? Most of the participants 51.4% said (yes) (male 73.6%, female 26.4%), 32.7% said (No) (male 65.9%, female 34.1%), and only 15.9 % answered (I do not know) (male 72.5%, female 27.5%). Figure (6) & Cross tabulation (4)

The participants' response to: Do you like to participate in educational activities on how to help you abstain from smoking? Most of the participants (57.4%) said (yes) (male 74.3%, female 25.7%), 29.5 % said (No) (male 68.9%, female 31.1%), and only 13.1 % answered (I do not know) (male 60.6%, female 39.4%). Figure (7) & Cross tabulation 5.

**Table (1): Distribution of participants by sex**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid female	73	29.1	29.1	29.1
male	178	70.9	70.9	100.0
Total	251	100.0	100.0	

**Table (2): Distribution of participants by age**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 19 years and <	12	4.8	4.8	4.8
20-24 years	100	39.8	39.8	44.6
25-29 years	12	4.8	4.8	49.4
30-34 years	24	9.6	9.6	59.0
35-39 years	33	13.1	13.1	72.1
40 years and >	70	27.9	27.9	100.0
Total	251	100.0	100.0	

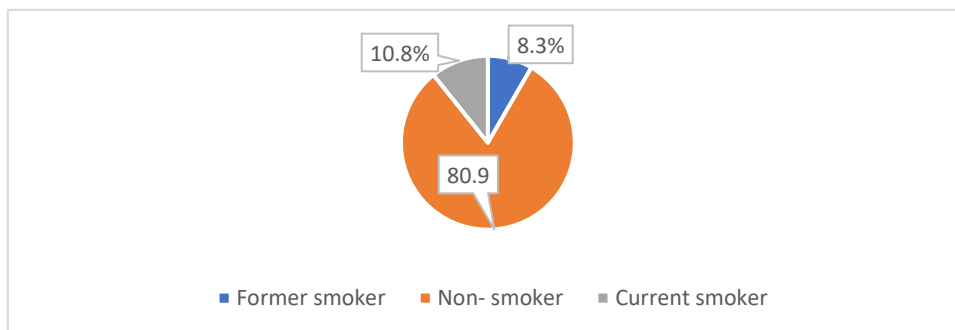
**Table (3): Distribution of participants by educational level**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid PHD holder	3	1.2	1.2	1.2
master holder	8	3.2	3.2	4.4
university graduate	121	48.2	48.2	52.6
high school completed	101	40.2	40.2	92.8
high school not completed	14	5.6	5.6	98.4
intermediate school completed	1	.4	.4	98.8
intermediate school not completed	1	.4	.4	99.2
primary school completed	2	.8	.8	100.0
Total	251	100.0	100.0	

**Table (4): Distribution of participants by occupation**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid lawyer	1	.4	.4	.4
retired	5	2.0	2.0	2.4
engineers	2	.8	.8	3.2
delivery man	1	.4	.4	3.6
nurse	1	.4	.4	4.0
medics	3	1.2	1.2	5.2
worker	6	2.4	2.4	7.6
doctor	4	1.6	1.6	9.2
computer trainer	1	.4	.4	9.6
housewife	7	2.8	2.8	12.4
teacher	34	13.5	13.5	25.9
employee	42	16.7	16.7	42.6
unemployed	16	6.4	6.4	49.0
computer science	2	.8	.8	49.8
pharmacist	9	3.6	3.6	53.4
radiologist	3	1.2	1.2	54.6
student	114	45.4	45.4	100.0
Total	251	100.0	100.0	

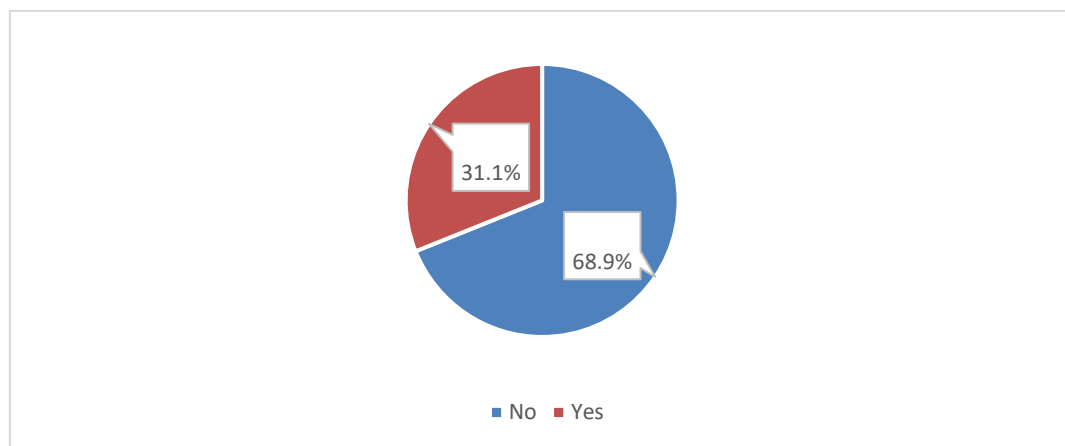
**Figure (1): Distribution of status of participants in regards to smoking in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents,**



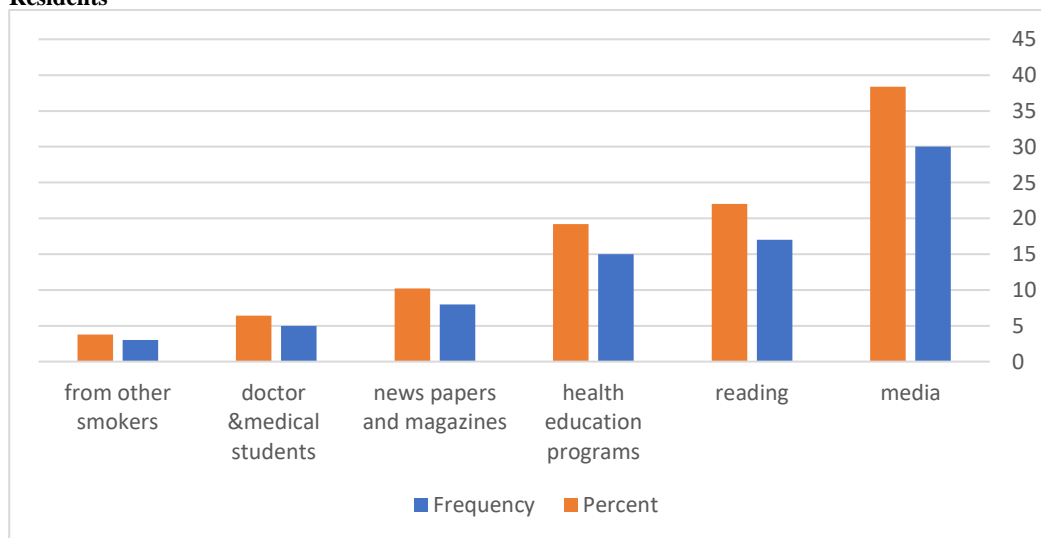
**Table (5): Distribution of participants by frequency of cigars per day**

Number of cigars\day	Frequency	Percent	Valid Percent	Cumulative Percent
Valid > 20 cigars	4	8.3	8.3	8.3
20 cigars	4	8.3	8.3	16.6
11-15 cigar	7	14.6	14.6	31.2
6-10 cigar	14	29.3	29.3	60.5
2-5 cigar	13	27.0	27.0	87.5
one cigar	6	12.5	12.5	100.0
Total	48.00	100.0	100.0	

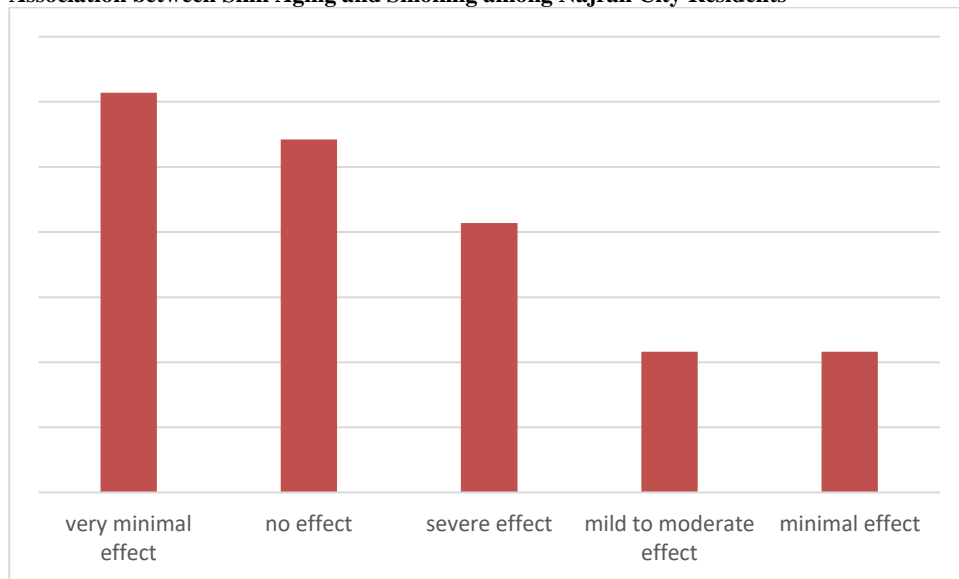
**Figure (2): Distribution of participants' knowledge about the relation between smoking and skin aging in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents**



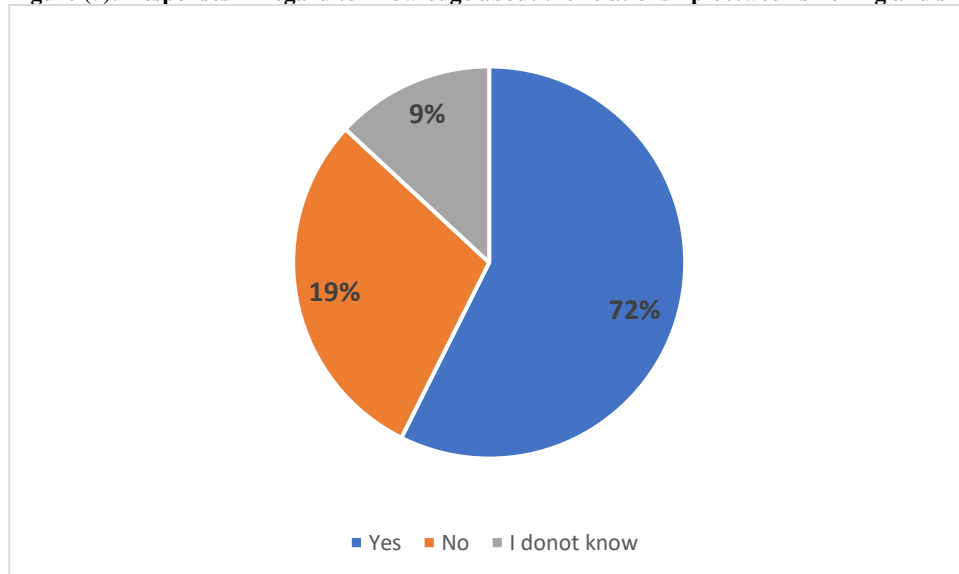
**Figure (3): Distribution of participants' source of information on smoking and skin aging in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents**



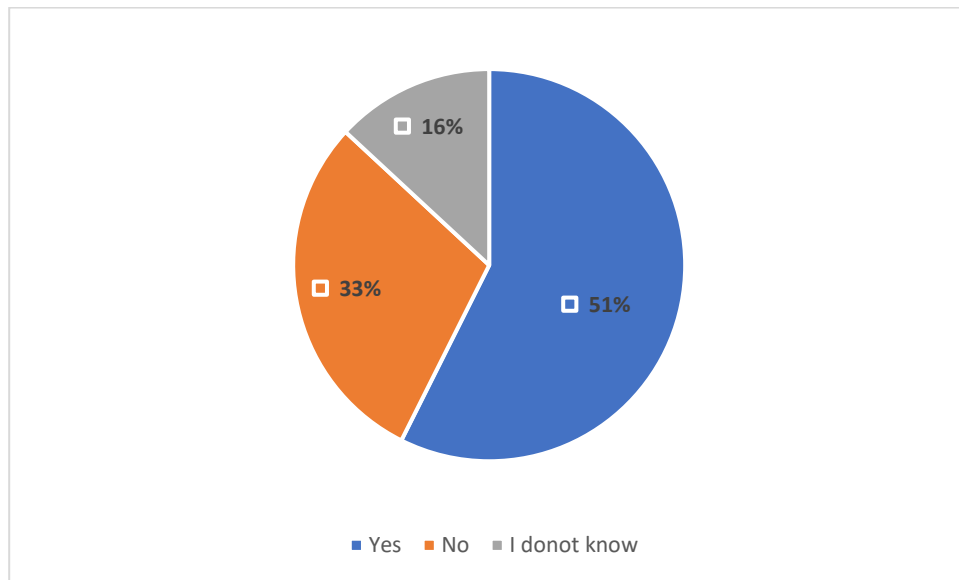
**Figure (4):** Distribution of participants' responses to: on a scale of 5, what is your opinion about the effect of smoking on premature skin aging? in the study of Knowledge and Awareness about the Association between Skin Aging and Smoking among Najran City Residents



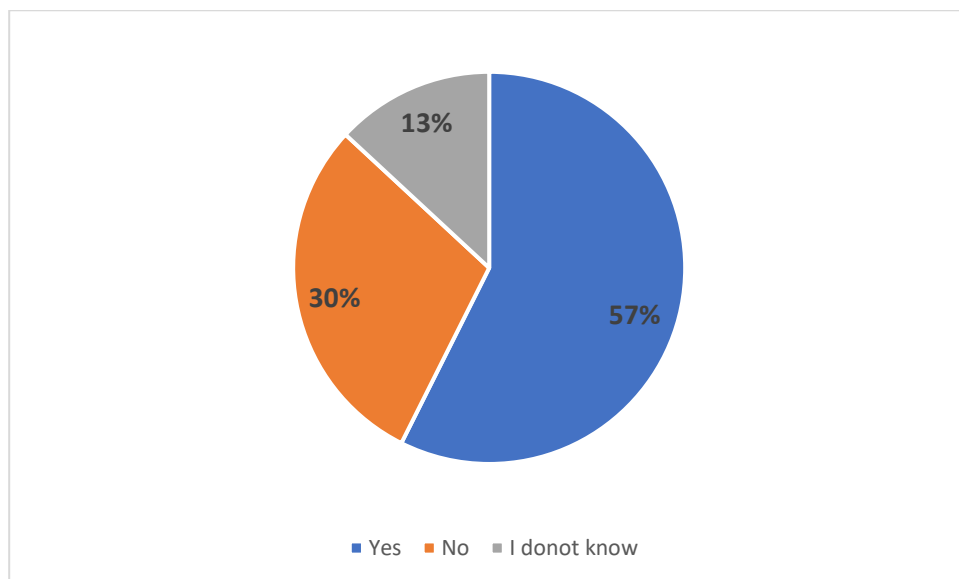
**Figure (5):** Responses in regard to knowledge about the relationship between smoking and skin aging



**Figure (6):** Distribution of the participants' responses if they would like to participate in educational activities, in regard to the relationship between smoking and premature skin aging



**Figure (7):** Distribution of the participants' responses if they would like to participate in educational activities, in regard to get help to stop smoking



**Discussion:**

In this study, we outline the general population's comprehension and awareness of the link between premature skin aging and the consumption of cigarettes.

Most of the respondents in this study were males (70.9%) and females 29.1 %, this result contradicts the findings of the Jeddah,

KSA, study that came out with (31.8% of males, 68.2% of females) conducted in 2019 by Fatani et al (**Fatani, et al., 2020**) .

Almost 39.8% of the participants were in the age range of 20–24 years, 27.9% were in the age range of 40 years and more, 13.1% were 35-39 years, 9.6 in the age range of 30-34 years, and 4.8% for both age range of 19 years and less and 25-29 years. This result is higher than



that of the findings of Mahouz et al in their study, Abha city 2013, which concluded that the participants of their study at the age group less than 30 years was 32.3%. also it is higher for the results gained by Fatani et al, which said the majority of the participants were between the ages of 18 and 34 years (Fatani, et al., 2020, Mahfouz, et al 2013 ).

Most participants graduated from university with a percentage of 48.2, and 40.2% completed the higher school level. This result is somehow higher than that found by Fatani et al who said just 13.8% had completed high school or less; the remaining individuals have greater levels of education. Nevertheless, the result was low compared to the findings of Mahouz et al in their study, Abha City 2013 university graduates were 68.3% and secondary school graduates were 24.9% (Fatani, et al., 2020, Mahfouz, et al 2013 ).

Most participants were students with a percentage of 45.4% and then came employer (mozaf) with 16.7%, teacher with 13.5%, and unemployed (without work) with 6.4%. I could not find data in this regards to compare my result.

The result of the Saudi Health Interview Survey, held in 2013 said that 12.1% of Saudis reported that they currently smoke tobacco; the outcome of this study was most of the participants were non-smokers (80.9%), 10.8% were current smokers, and 8.3% were former smokers. However, Fatani et al found that 12.6% of their participants were smokers the finding of both studies is approximate or near to the result of this study(Fatani, et al., 2020, Moradi, et al., 2015)

Smoking habits for current smokers and former smokers showed that 8.3% of the participants smoke more than 20 cigars per day, 8.3% smoke 20 cigars per day, 11-15 cigars per day for about 14.6%, 6-10 cigars per day is for 29.3% of the participants, 2-5 cigars per day for 27%, and one cigar per day is 12.5%. This result in some parts is higher than that concluded from the Saudi Health Interview Survey, held in 2013, which said 11.4% of smokers consume cigarettes daily with an

average of 15.0 cigarettes per day (Moradi, et al., 2015).

The response of 68.9% said (No) (77.5 % males, 22.5 % females) to their knowledge about the association between smoking and increased wrinkles, and 31.1% answered (Yes) (56.4 % males, 43.6 % females). This result is the same as concluded by M. Demierre et al. who said current smokers are less likely to be aware of the association between skin aging and smoking. Still, nearly one-fourth believe it could influence their decision to quit. However, the result contradicts that of Arwa Fatani et al. who said (64%) of the participants correctly answered that smoking increases facial aging, but among current smokers, there was no statistically significant association between awareness and motivation to quit(Fatani, et al., 2020), (Demierre, et al., 1999).

38.4 % of their knowledge is from media, 22% is from reading about the topic, 19.2% is gained from health programs, 10.2% from magazines and newspapers, 6.4% of knowledge is due to their jobs (doctors& medical students), and 3.8% gained knowledge from other smokers. However, Morita et al found that; smokers frequently fail to see the negative consequences of smoking on their skin, mostly because they believe nicotine to be the only dangerous ingredient in tobacco. This suggests that educational campaigns should address these misconceptions on the wider effects of cigarette smoke on skin health (Morita, 2020) . Meanwhile Fatani et al said that the levels of knowledge about the link between smoking and skin aging may vary by age group, with younger individuals potentially more susceptible to skin health education. Older groups can play a crucial role in educating younger generations about the dangers of smoking (Fatani, et al., 2020).

As a response to the question on a scale of 5, what is your opinion about the effect of smoking on premature skin aging? 30.7% of participants answered that the effect is very minimal (male 80.5%, female 19.5%), 27.1% said no impact( male 67.6%, female 32.4%), 20.7% ( male 71%, female 29%), said that it has a severe effect, mild to moderate effect, and

minimum effect is 10.8% of the responses each of them. I could not find a reference to compare this result. Ford et al at the website of tobacco free life mentioned that there are myths about smoking and skin aging although there is some awareness, there is still a large information gap, especially among smokers. Many smokers are unaware of how much smoking alters the appearance of their skin. Due to a lack of knowledge, people may undervalue the negative effects of smoking on their appearance in favor of other health concerns. This conclusion can support the result of this study with male predominance in this concept (Ford, 2016).

The participants' response to: do you want to know more about the relationship between smoking and skin aging? More than two-thirds of the participants are willing to know more about the relationship between smoking and skin aging (72.1%) (71.3% males, 28.7% females) said (yes), 19.1% (68.8% males, 31.2% females) said (No), and only 8.8% (72.7% males, 27.3% females) answered (I do not know). I could not find a reference to compare this result. This result matches that of Fatani et al who mentioned In one study, for example, participants acknowledged that smoking causes wrinkles and face aging, but smokers were less likely to perceive this relationship than non-smokers, even though 64% of them did. This implies that since many smokers might not be entirely aware of the consequences smoking has on their looks, educational initiatives could be well-received (Fatani, et al., 2012).

The participants responded to: Do you want to participate in educational activities, by attending or providing information on the relationship between smoking and premature skin aging? Most of the participants (51.4%) said (yes) (male 73.6%, female 26.4%), 32.7% said (No) (male 65.9%, female 34.1%), and only 15.9% answered (I do not know) (male 72.5%, female 27.5%). I could not find a reference to compare this result.

This result is supported by the finding of (Fatani et al 2020) who mentioned In one study, for example, participants acknowledged that smoking causes wrinkles and face aging, but smokers were less likely to perceive this

relationship than non-smokers, even though 64% of them did. This implies that since many smokers might not be entirely aware of the consequences smoking has on their looks, educational initiatives could be well-received (Fatani, 2020).

The participants responded to: Do you like to participate in educational activities on how to help you abstain from smoking? Most of the participants (57.4%) said (yes) (male 74.3%, female 25.7%), 29.5% said (No) (male 68.9%, female 31.1%), and only 13.1% answered (I do not know) (male 60.6%, female 39.4%). I could not find a reference to compare this result. In a study in Africa published in 2024, Oke et al said that research subjects have demonstrated a readiness to participate in smoking cessation education initiatives. People have proposed, for instance, that additional campaigns for advocacy and sensitization be launched, especially those that include smokers who are already smokers as advocates for the cause. This suggests understanding the value of peer-led campaigns in raising awareness and enticing involvement. This result matches the readiness of the participants in this study to be a part of smoking cessation education initiatives (Oke, et al., 2024).

### Acknowledgments

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### Conflicts of Interest:

The author declares that she doesn't has any potential conflicts to be declared.

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