

How People with Facial Acne Scars are Perceived in Society: an Online Survey

Brigitte Dréno · Jerry Tan · Sewon Kang · Maria-José Rueda ·
Vicente Torres Lozada · Vincenzo Bettoli · Alison M. Layton

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ABSTRACT

Introduction: Atrophic scarring occurs throughout the course of inflammatory acne and across the spectrum of severity. This study

On behalf of the Global Alliance to Improve Outcomes in Acne. Brigitte Dréno, Jerry Tan, Sewon Kang, Vicente Torres Lozada, Vincenzo Bettoli and Alison M Layton are members of the Global Alliance to Improve Outcomes in Acne.

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B. Dréno (✉)
Department of Dermato Cancerology, Nantes
University, Nantes, France
e-mail: brigitte.dreno@wanadoo.fr

J. Tan
University of Western Ontario and Windsor Clinical
Research Inc, Windsor, ON, Canada

S. Kang
Department of Dermatology, Johns Hopkins School
of Medicine, Baltimore, USA

M.-J. Rueda
Galderma Laboratories, L.P., Fort Worth, TX, USA

evaluates perceptions of the general population toward individuals with clear skin and acne scars.

Methods: An online survey administered in the USA, UK, Japan, Germany, France and Brazil to respondents 18 years and over presented three facial pictures of clear skin or digitally superimposed acne scars (but no active acne lesions) in a random fashion. At least one clear and one scar picture were presented to each participant.

Results: Among the 4618 responders, 33% themselves had facial acne scars. The skin was the first thing noticed about the face by 41% when viewing pictures with scars vs 8% viewing clear skin ($p < 0.05$). Those with scars were less

V. Torres Lozada
Department of Dermatology, Juarez Hospital,
Mexico City, Mexico

V. Bettoli
Section of Dermatology, Department of Medical
Sciences, University of Ferrara, Ferrara, Italy

A. M. Layton
Harrogate and District NHS Foundation Trust,
Harrogate, UK

likely to be considered attractive (17% vs 25%), confident (25% vs 33%), happy (23% vs 30%), healthy (21% vs 31%) and successful (17% vs 24%), and more likely to be perceived as insecure (15% vs 8%) and shy (23% vs 14%) compared with those with clear skin (all $p < 0.05$). The significance of the responses obtained varied according to the acne and scar status of the respondent. Skin care was cited as the habit most in need of improvement by 59% vs 13% of respondents viewing pictures with scars vs clear skin, respectively ($p < 0.05$). All respondent subgroups cited skin care irrespective of their own acne and scar status (all $p < 0.05$ vs pictures with clear skin). Those with scars were thought less likely to have a promising future (78% vs 84%) than those with clear skin ($p < 0.05$). The majority of respondents reported willingness to pay money to eradicate scars.

Conclusion: The results of this multi-national survey demonstrate that facial acne scars are perceived negatively by society, confirming the importance of preventing acne scars with early treatment of inflammatory acne.

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Keywords: Acne; Negative; Perception; Quality of life; Scars; Society; Treatment

INTRODUCTION

Acne is one of the most common skin diseases, affecting around 650 million of the world's population [1]. It is a multifactorial disease encompassing comedones, papules, pustules, nodules and scars [2, 3]. Scarring can remain for life and therefore act as a prominent and visible reminder of the disease [3]. Atrophic acne scarring is more frequent than many individuals may realize, with at least 40% of active acne patients having scars [4].

Over the years, several different risk factors have been linked with scar development [5–7]. Recent data highlight that acne severity, time between acne onset and first effective treatment, and acne relapse after treatment are key factors related to scarring. Although scarring occurs most frequently in patients with severe or very severe acne, it is becoming increasingly apparent that scars can occur in patients with all severities of acne, including those who are almost clear or have mild acne [4]. Inflammation of the pilosebaceous follicle deep within the dermis is one of the main pathophysiological processes involved in acne scarring, with data showing that the type and magnitude of the inflammatory response is strongly linked with scar development [3, 5–7]. Other factors related to scar development include family history of acne, acne location and acne duration [4, 8, 9]. Acne scars are more common on the face than on the back and chest [8, 9]. The presence of clinically relevant scarring, defined as mild or greater, increases with acne duration and reaches a peak after a person has had acne for 2–3 years [9].

Acne can have a huge impact on a person's quality of life. It can cause depression, which may result in impaired social functioning and suicidal ideation [10]. In addition, the social, psychological and emotional problems experienced by individuals with acne can be worse than those experienced by individuals with other limiting long-standing illnesses, such as asthma, epilepsy and arthritis [11].

Scarring is often the primary concern of a patient with acne [3]. It has been known for a long time that acne scarring can cause depression and is a risk factor for suicide [12]. More data are now beginning to emerge on the impact of acne scars, specifically on quality of life. Individuals want to hide or cover their scars and feel embarrassed, self-conscious and/or less

self-confident. Scars are also a source of frustration, sadness, anger and/or anxiety. People who develop acne scars feel their appearance interferes with their professional relationships and chances of future employment [4]. The prevention of acne scars therefore needs to be viewed as a major goal in the treatment of inflammatory acne [7]. Early, aggressive and appropriate treatment of acne before scarring occurs is important, as it may effectively decrease the risk of acne scarring [2–5, 13].

As early as the 1970s, the impact of physical appearance ‘stereotypes’ on social desirability and future career prospects has been evaluated [14, 15]. More recently, numerous studies have shown that judgments and decisions are often negatively impacted by physical appearance, for example higher weight is associated with lower wages, attractiveness is an advantage when job applications are mediocre and high facial adiposity reduces the perceived leadership ability [16–19]. Dermatologists focused on acne from the Global Alliance to Improve Outcomes in Acne group hypothesized that the presence of acne scars would elicit negative impressions on other people’s perceptions of such individuals, which would also impact judgments made about them. Therefore, the aim of this study was to evaluate the perceptions of the general population aged 18 years and over to individuals with either clear skin or digitally superimposed acne scars, but no active acne lesions.

METHODS

A survey was developed by members of the Global Alliance to Improve Outcomes in Acne group (Online Appendix). The study was conducted between September 12 and September 18, 2012 using an email invitation

followed by an online survey. Email addresses were obtained from individuals who had self-opted to participate in research surveys through a variety of sources. The survey was administered in six countries (USA, UK, Japan, Germany, France and Brazil) among respondents from the general population aged 18 years and over, identified from the large database of email addresses available. Quotas were set for demographic factors such as gender, region, ethnicity and age to ensure reliable and accurate representation of the entire population aged 18 and over in each country. All respondents took the survey in their native language.

As part of the survey, each respondent answered questions about facial pictures of men and women with either clear skin or digitally superimposed acne scars, but no active acne lesions (Fig. 1). A total of 12 images per country were used in the survey, comprising 50% male and 50% female with one clear and one scarred picture for six separate models. Each respondent was presented with three facial pictures in a random fashion, the only condition being that at least one clear and one scarred picture was presented to each participant. Respondents in each country saw a mix of ethnicities that represented the demographic of their nation. This design allowed the respondents to focus in-depth on specific visual stimuli and kept the survey at a reasonable length. Respondents also answered questions without seeing pictures, which included questions about their own experiences with acne and acne scars.

The data were processed using the Quantum software (Unicom Systems, Inc, Mission Hills, CA, USA) and T-tests run using a 95% confidence level/5% risk level. Only significant differences equal to or higher than the designated confidence level were reported.

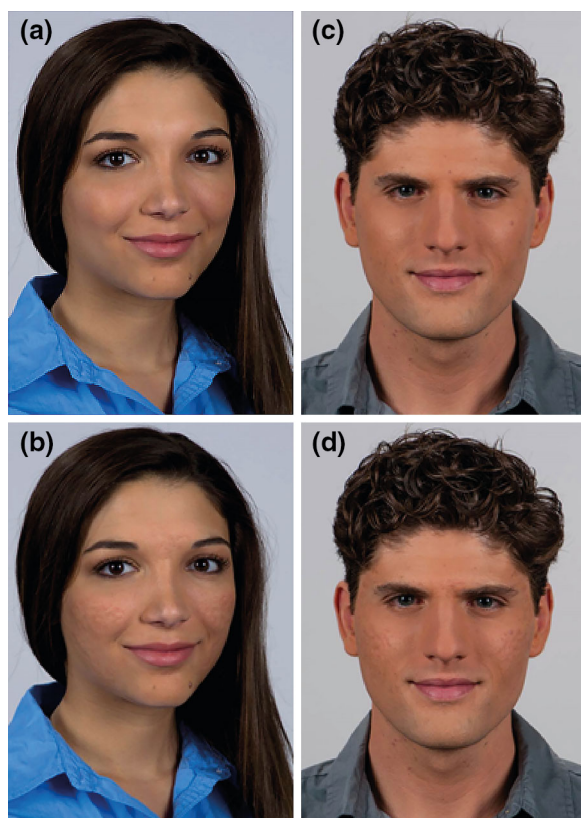


Fig. 1 Facial pictures of an individual with clear skin (a and c) and with digitally superimposed acne scars (b and d)

This article does not contain any new studies with human or animal subjects performed by any of the authors.

RESULTS

Experiences of Acne and Acne Scars Among Respondents

Responses were obtained from 4618 individuals (American: 1039; British: 714; Japanese: 701; German: 703; French: 736; Brazilian: 725) aged 18 years and over (ages 18–25: 15%; ages 26–35: 18%; ages 36–50: 30%; ages 51+: 38%). There was a similar distribution between male and female respondents (male: 49%; female: 51%).

A total of 13% of respondents presently had acne, 46% had acne previously and 41% never had acne. Among the subgroups who presently had acne or had acne previously, 29% had used prescription acne treatments (39% presently with acne vs 26% previously with acne, $p < 0.05$), 43% were never warned about scars that might result from their acne (34% presently with acne vs 46% previously with acne, $p < 0.05$) and 33% had current scars on the face as a direct result of their acne (58% presently with acne vs 25% previously with acne, $p < 0.05$). Approximately two-thirds (66%) of all respondents questioned from the UK and US (the only countries where this question was asked) would be more concerned about the way their face would look with scars resulting from acne, rather than the acne itself (34%).

First Impressions of Others

When provided with a list of facial features without seeing any pictures, 17% of respondents reported that they typically noticed a person's skin first, compared with 60%, 11%, 8% and 4% for eyes, hair, mouth and nose, respectively. These results did not vary among those respondents presently with acne, previously with acne, with no acne presently/previously, with acne presently/previously without current acne scars or with acne presently/previously with current acne scars. Eyes were first noticed significantly more frequently among respondents previously with acne (60%) or with no acne presently/previously (62%) compared with respondents presently with acne (55%; both $p < 0.05$). Skin was first noticed significantly more frequently among respondents presently with acne (21%) compared with respondents previously with acne (17%) or with no acne presently/previously (16%; both $p < 0.05$). Respondents

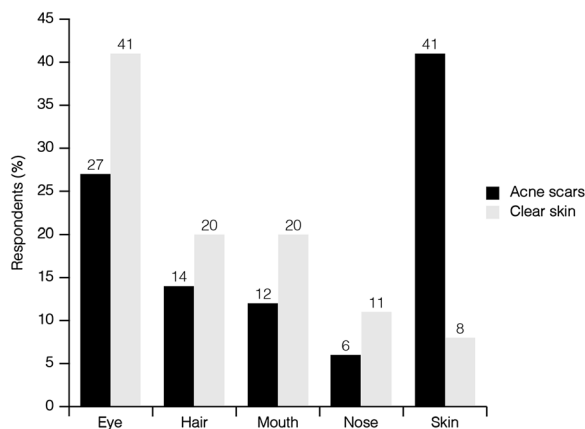


Fig. 2 First thing noticed about a person’s face when viewing pictures with either digitally superimposed acne scars or clear skin. $p < 0.05$ for each facial feature when viewing pictures with digitally superimposed acne scars vs clear skin

with acne presently/previous with current acne scars were less likely to notice the eyes (55% vs 61%; $p < 0.05$) and more likely to notice the skin (22% vs 16%; $p < 0.05$) compared with respondents with acne presently/previous without current acne scars.

When viewing the pictures presented, the proportion of respondents reporting the skin was the first thing they noticed about the person’s face increased to 25% and was significantly higher when viewing pictures of those with acne scars vs clear skin ($p < 0.05$, Fig. 2). When viewing pictures of those with acne scars, the results for eye, mouth and nose did not vary significantly among respondents presently with acne, previously with acne, with no acne presently/previous, with acne presently/previous without current acne scars or with acne presently/previous with current acne scars. Hair was first noticed significantly more frequently among respondents previously with acne (14%) or with no acne presently/previous (15%) compared with respondents presently with

acne (11%; both $p < 0.05$). Among respondents presently with acne, skin was first noticed significantly more frequently (45%) compared with respondents previously with acne (41%) or with no acne presently/previous (41%; both $p < 0.05$). Respondents with acne presently/previous with current acne scars were less likely to notice the hair (11% vs 14%; $p < 0.05$) and more likely to notice the skin (44% vs 40%; $p < 0.05$) compared with respondents with acne presently/previous without current acne scars.

Emotional and Personal Attributes

In comparison to the pictures of those with clear skin, those with acne scars were less likely to be considered attractive, confident, happy, healthy and successful, and more likely to be perceived as insecure and shy (all $p < 0.05$; Table 1).

The significance of the responses obtained for these attributes varied according to the acne and scar status of the respondent (Table 2).

Just based on their appearance, respondents were less willing to be friends with acne scarred

Table 1 Traits of individuals based on pictures with either digitally superimposed acne scars or clear skin

Trait	Acne scars (%) ($n = 6956$ pictures)	Clear skin (%) ($n = 6898$ pictures)	p value
Attractive	17	25	<0.05
Confident	25	33	<0.05
Happy	23	30	<0.05
Healthy	21	31	<0.05
Insecure	15	8	<0.05
Shy	23	14	<0.05
Successful	17	24	<0.05

Respondents were able to choose all that applied

Table 2 Traits of individuals based on pictures with either digitally superimposed acne scars or clear skin according to both acne and scar status of the respondent

Trait	Pictures with acne scars			Pictures with clear skin		
	No present/ previous acne (%) (<i>n</i> = 2848)	Present/previous acne without current scars (%) (<i>n</i> = 2758)	Present/previous acne with current scars (%) (<i>n</i> = 1350)	No present/ previous acne (%) (<i>n</i> = 2816)	Present/previous acne without current scars (%) (<i>n</i> = 2762)	Present/ previous acne with current scars (%) (<i>n</i> = 1320)
Attractive	18*	17	14	27 [†]	24 [‡]	24 [‡]
Confident	25	25	24	34 [‡]	32 [‡]	33 [‡]
Happy	23	22	24	33 [†]	28 [‡]	30 [‡]
Healthy	21	21	20	31 [‡]	31 [‡]	30 [‡]
Insecure	16 [§]	13**	14**	8	8	7
Shy	23**	22**	22**	14	14	15
Successful	18	16	18	24 [†]	22 [‡]	17 ^{††}

Respondents were able to choose all that applied

* $p < 0.05$ vs pictures with acne scars viewed by respondents with present/previous acne with current scars

** $p < 0.05$ vs pictures with clear skin viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars

[†] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars and pictures with clear skin viewed by respondents with present/previous acne without current scars

[‡] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars

[§] $p < 0.05$ vs pictures with acne scars viewed by respondents with present/previous acne without current scars and pictures with clear skin viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars

^{††} $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars and pictures with clear skin viewed by respondents with no present/previous acne or present/previous acne without current scars

individuals than those with clear skin (62% vs 66%; $p < 0.05$). However, they were just as willing to introduce both groups to their close friends (24% vs 25%, respectively) and let them take care of their child/children (4% vs 3%, respectively).

Respondents felt the presence of scars would have a negative impact on an individual's life. Those with acne scars compared to those with clear skin were perceived to be more likely to feel stressed (35% vs 26%, $p < 0.05$), to generally make people feel uncomfortable (30% vs 24%; $p < 0.05$) and to be unhappy with their life (31%

vs 24%; $p < 0.05$). The presence of acne scarring was seen to have some impact on what individuals would be most likely to do on a typical weekend, with 17% vs 13% of respondents feeling that those with acne scars compared to those with clear skin would stay at home by themselves, respectively ($p < 0.05$).

When asked which one habit (from a list provided) the individual in the picture most needed to improve, there was a 46% difference in the proportion of respondents citing skin care when viewing pictures of those with acne scars vs clear skin (59% vs 13%; $p < 0.05$). When viewing

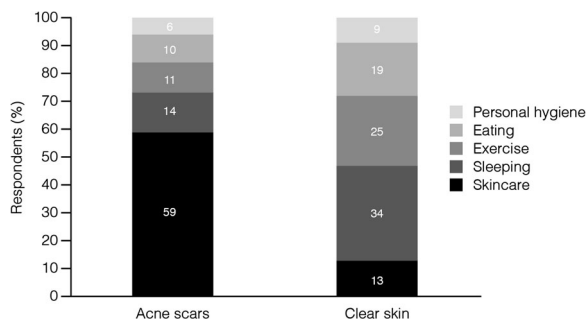


Fig. 3 Habit requiring most improvement based on pictures with either digitally superimposed acne scars or clear skin. $p < 0.05$ for each habit when viewing pictures with digitally superimposed acne scars vs clear skin

pictures of those with acne scars, skin care was the habit most commonly chosen to be in need of improvement (59%), whereas sleeping was most popular with clear skin at 34% (Fig. 3). Respondents with no acne presently/prevously, acne presently/prevously without current acne scars or acne presently/prevously with current acne scars viewing pictures of those with acne scars all cited skin care as the habit most in need of improvement significantly more frequently than when viewing pictures of those with clear skin (Table 3).

Skill Set and Prospects

When provided with a list of skills, respondents were less likely to perceive those with acne scars as having skills in public speaking, sports, kissing, sex and singing (all $p < 0.05$, Table 4); the remainder of the skills were found not to be statistically significant. The responses obtained for these skills varied according to the acne and scar status of the respondent (Table 5). Those with scars were thought less likely to be hired for a job after a job interview (78% vs 82%; $p < 0.05$), to be seen as a good entrepreneur (19% vs 23%; $p < 0.05$) or to have a promising future (78% vs 84%; $p < 0.05$) than those with clear skin.

Cost Impact of Scars

Many respondents affected by acne scars reported willingness to pay at least some money to get rid of their scars forever (68% of Americans and 66% of Japanese) or to have their skin free from scars/blemishes (58% of Germans). In the UK, 71% of respondents felt acne scar sufferers would be willing to spend at least some money (an average of £1673) to permanently remove their scars. Similarly, a majority of French respondents (59%) and Brazilians (67%) would rather spend more money on products that would make their skin free from scars or blemishes than on high-end clothing or shoes.

DISCUSSION

People often judge others and make decisions based on an individual’s physical appearance [14–19]. To our knowledge, this is the first in-depth, multi-national survey conducted to evaluate the perceptions of people (with or without acne) toward individuals with clear skin compared to those with acne scars (but no active acne lesions).

This study demonstrates that those with acne scars are perceived differently—with unfavorable attributes. Furthermore, the skin is more frequently the first facial feature noticed if an individual has acne scars vs clear skin. Taken together, the results of this survey suggest that observers infer that acne scars reflect neglectfulness of one’s health and skin care habits, as well as appearance. Interestingly, when viewing pictures with acne scars, skin care was still cited as the habit requiring most improvement irrespective of the acne and scar status of the respondent. Although individuals with acne scars believe that such scars have a

Table 3 Habit requiring most improvement based on pictures with either digitally superimposed acne scars or clear skin according to both acne and scar status of the respondent

Habit	Pictures with acne scars			Pictures with clear skin		
	No present/ previous acne (%) (<i>n</i> = 2848)	Present/previous acne without current scars (%) (<i>n</i> = 2758)	Present/previous acne with current scars (%) (<i>n</i> = 1350)	No present/ previous acne (%) (<i>n</i> = 2816)	Present/previous acne without current scars (%) (<i>n</i> = 2762)	Present/ previous acne with current scars (%) (<i>n</i> = 1320)
Skincare	61*	58*	58*	13	13	13
Sleeping	13	14	15	36 [†]	32 [‡]	33 [‡]
Exercise	11	11	9	24 [‡]	26 [‡]	25 [‡]
Eating	9	10	11 [§]	18 [‡]	20 [‡]	19 [‡]
Personal hygiene	6	6	7	9 [‡]	9 [‡]	10 [‡]

* $p < 0.05$ vs pictures with clear skin viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars

[†] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars and pictures with clear skin viewed by respondents with present/previous acne without current scars or present/previous acne with current scars

[‡] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars

[§] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne

negative impact on their own quality of life [4], it is worrying that other people may also judge them by the presence of such scars. This negative perception is likely to have a further impact on the burden of those with acne scars. Importantly, despite cultural differences, results were similar in all countries where the survey was carried out.

Parallels can be drawn with a previous study showing that judgments regarding personality based on physical appearance viewed through full-body photographs varied depending on posture, expression and pose [20]. More recent data highlight that facial features also impact first impressions, including approachability, youthful attractiveness and dominance to different degrees [21].

This study demonstrates that the presence of acne scars can have a negative impact on perceived skill set and future prospects. It is

unclear whether people with acne scars encounter lesser social or occupational opportunities, but these results suggest that further research regarding such impediments may be of value.

Many adults have latent fears and insecurities about acne scars, as highlighted by the survey results showing that participants would be willing to pay money to rid themselves of scars forever. The survey questions on this topic differed slightly per country, in line with cultural expectations and currencies used.

A significant challenge for health-care professionals is that less than one-third (29%) of survey participants who had acne at some point in their life (either presently or previously) had used prescription acne treatments and almost half (43%) had never been warned about scars that might result from

Table 4 Skills of individuals based on pictures with either digitally superimposed acne scars or clear skin

Skill	Acne scars (%) (<i>n</i> = 6956 pictures)	Clear skin (%) (<i>n</i> = 6898 pictures)	<i>p</i> value
Kissing	12	16	<0.05
Public speaking	24	32	<0.05
Sex	12	15	<0.05
Singing	11	13	<0.05
Sports	23	27	<0.05
Cleaning	14	14	N/S
Cooking or baking	21	21	N/S
Math	29	28	N/S
Playing musical instruments	20	19	N/S
Science	23	23	N/S
Technology, such as operating or fixing electronics	25	25	N/S
Video games	18	17	N/S
Writing	29	29	N/S
Other (specify)	2	2	N/S
Nothing	8	7	N/S

Respondents were able to choose all that applied
N/S not significant

their acne. Since clinically relevant scarring increases with acne duration and a delay in starting appropriate treatment [4, 8, 9], it is important that everyone with acne is informed about the risk of scarring and is treated early and effectively to decrease this risk.

Although most respondents were more concerned about the way their face would look with scars resulting from acne rather than the acne itself, many had not used prescription acne treatments to help decrease the risk of such scars [2–5, 13]. There is a need to address this issue to gain insight into why individuals might

not seek medical advice for the treatment of their acne. Since the treatment of scars remains difficult, many will have permanent scars. This persistence is another reason for informing individuals with acne and health-care professionals about scar prevention.

Parallels can be drawn between the results presented here and the data obtained in a study conducted by Ritvo et al. looking at the perceptions of teenagers with acne [22]. This study used similar methodology to the one used here and provided insights regarding the negative perception of others to individuals with acne.

The current survey has limitations because participants had to be willing to take part in the survey and able to complete it online. In addition, the survey does not address the long-term psychosocial effect of acne scarring. Further research is needed to evaluate data from different countries and ethnic groups to see if this has any impact on the results obtained. A recent publication demonstrated that 90.8% of Japanese acne patients have atrophic or hypertrophic acne scars, which have adversely impacted their quality of life [23].

The results obtained confirm the hypothesis from the Global Alliance to Improve Outcomes in Acne group regarding the negative perceptions surrounding acne scars and broaden our understanding of the potential impact of acne scars on an individual’s quality of life based on the perceptions of society. Increased education around risk factors associated with scar development and the long-term impact of scarring on both an individual with scars and those around them is warranted. Further consideration must also be given to the need for early and appropriate treatment to reduce the likelihood of acne scar development, so that acne patients are apprised of both the short- and long-term potential complications of acne.

Table 5 Skills of individuals based on pictures with either digitally superimposed acne scars or clear skin according to both acne and scar status of the respondent

Skill	Pictures with acne scars			Pictures with clear skin		
	No present/ previous acne (%) (<i>n</i> = 2848)	Present/previous acne without current scars (%) (<i>n</i> = 2758)	Present/ previous acne with current scars (%) (<i>n</i> = 1350)	No present/ previous acne (%) (<i>n</i> = 2816)	Present/previous acne without current scars (%) (<i>n</i> = 2762)	Present/ previous acne with current scars (%) (<i>n</i> = 1320)
Kissing	11	12	13	16*	14 [†]	19 [‡]
Public speaking	22	25 [§]	28 [†]	29 [†]	33**	37 [‡]
Sex	10	13 [§]	13 [§]	14 [†]	14 [§]	18 [‡]
Singing	9	12 [§]	14 [§]	12 [§]	13 [§]	16 ^{††}
Sports	23	24	22	28*	26*	27*

Respondents were able to choose all that applied

* $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars

** $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars and pictures with clear skin viewed by respondents with no present/previous acne

[†] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne or present/previous acne without current scars

[‡] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne, present/previous acne without current scars or present/previous acne with current scars and pictures with clear skin viewed by respondents with no present/previous acne or present/previous acne with no current scars

[§] $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne

^{††} $p < 0.05$ vs pictures with acne scars viewed by respondents with no present/previous acne or present/previous acne without current scars and pictures with clear skin viewed by respondents with no present/previous acne or present/previous acne with no current scars

CONCLUSION

This multi-national survey suggests that early treatment of primary acne lesions to decrease the risk of acne scarring is important in preventing acne scars, as they can be perceived negatively by society.

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Compliance with Ethics Guidelines. This article does not contain any new studies with human or animal subjects performed by any of the authors.

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