

CASE REPORT

Impact of pigmentary disorders on quality of life in Japan: Interest of the *BeautyQoL* instrument

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Abstract

Skin pigmentary disorders and uneven skin tone represent common cosmetic concerns in Japan where fairer skin is culturally desirable. As the demographics of Asian countries continue to evolve, there is a need to understand the impact of cosmetic skin concerns on quality of life (QoL). 199 Japanese women self-claiming facial skin pigmentation disorders were asked to complete the *BeautyQoL* questionnaire, and the results were compared with those of a control group of 200 women. Of the five dimensions of the *BeautyQoL* questionnaire, the dimension “mood” appeared to be significantly lower in the group presenting facial dark spots, as compared with the control group ($p < 0.05$). In the group presenting facial dark spots, the five dimensions and the global score showed that subjects concerned had lower scores than subjects less concerned, even if statistical significance was not reached.

This study confirms that common pigmentary disorders such as facial black spots may negatively impact QoL. Further comparative studies with a controlled randomized design would be necessary to confirm these findings.

Key Words: pigmentation, skin disorders, quality of life, dermatology, well-being, facial attractiveness, emotion, sensory, skin feel, cosmetics

Background

Research shows that physical appearance is one of the key drivers of personal well-being: an improvement in facial attractiveness is associated with positive changes in emotional and social dimensions of one's life, such as personality, interpersonal relationships, and self-esteem (1). Individuals seek to improve their facial attractiveness by either superficial means (i.e., using makeup) or invasive procedures (i.e., cosmetic surgery) because of the social and personal benefits brought by an improved appearance.

Makeup camouflage is an important means of superficial cosmetic improvement for people who have had their physical appearance altered due to a transient or chronic clinical condition, such as pigmentary disorders. These patients, especially if they are young, are at a higher risk of negative emotional consequences brought about by altered facial characteristics (2). A study in China has established

that patients with vitiligo experienced significantly impaired health-related quality of life (QoL) and unstable marital relationships (3). Using validated QoL instruments in dermatology, acne patients have been shown to experience levels of social, psychological, and emotional distress similar to those reported in patients with asthma, epilepsy, and diabetes (4). Skin pigmentary disorders and uneven skin tone represent common cosmetic concerns in Asian populations where fairer skin is culturally desirable (5–7). There are many causes of acquired pigmentation disorders on the face, which are seen more often in ethnic groups of non-Caucasian skin types (5,8–10). Importantly, sun-induced skin damage in Asian populations leads more often to pigmentary changes rather than wrinkling (5,11). Although laser therapy and light sources are used to treat skin imperfections (5,11), pigmentary disorders have been reported to affect self-perception,

Table I. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • Healthy Japanese women aged 17–76 years • Did not experience significant events (either personal or professional) which could have impacted their life (change in marital status, professional promotion or transfer, change in work status, new house, serious injury or sickness, mourning, etc.) 	<ul style="list-style-type: none"> • Visible trace of inflammation of skin allergy or atopy, on face or on scalp. • Laser treatment, deep chemical peeling, injection of collagen/botox, or application of anti-inflammatory products on face in the past 6 months • Plastic surgery on face • Permanent makeup on face • Pregnant women • Breastfeeding women (6 months after childbirth) • Long-term medical treatment for allergy or asthma, or on immunosuppressive treatment • Employed by a cosmetic manufacturer, mass media or marketing research agency, esthetician, makeup artist, or hair stylist

self-esteem, social and professional activities, and QoL (12–16). As the demographics of Asian countries continue to evolve, there is an increasing need to understand the impact of cosmetic skin concerns on QoL (17,18).

Objective

The objective of this case–control study was to assess the impact of facial skin pigmentary disorders on health-related QoL in Japanese women and to assess how the *BeautyQoL* instrument could contribute to improving our knowledge about this issue.

Methods

A total of 199 women (aged 17–76 years) self-claiming facial skin pigmentation disorders were recruited and compared with a control group of 200 women. The subjects from both groups were matched according to their age group and skin type. The inclusion and exclusion criteria are provided in Table I.

This QoL survey was conducted over a 7-week period (January–February 2011) in Tokyo, Japan. It included two groups of adult women self-reporting pigmentary concerns. The first step consisted in recruiting and categorizing the subjects from a population of adult women issued from the general population who had participated in a 2009 skin typology assessment involving 772 Japanese women. All subjects were screened to assess if they had pigmentary concerns by asking them to answer three questions regarding the facial skin conditions presented in Table II. The first group composed of subjects replying positively to the first item of the first question (Do you have dark spots and/or freckles?), replying to the first answering modality of the second question (I am very much concerned), and to the last answering modality of the third question (I don't think at all that I would be able to fix the problem with skin care or makeup) (Figure 1). The second group was composed of subjects from the general population. As stated in the inclusion and

exclusion criteria, and with regard to the various and well-spread beauty routines in Japan, verifications were also made to ensure that all subjects had not experienced any laser treatment, deep chemical peeling, injection of collagen/botulinum toxin in the previous 6 months, or that they had not applied anti-inflammatory products on their face (such as corticosteroids) in the 4 weeks preceding the assessment. Confirmation was obtained that no significant event (personal and/or professional) had recently impacted their life. The second step consisted of assessing QoL. This was achieved using the *BeautyQoL* instrument, a new QoL questionnaire composed of 42 questions, which was specially designed to assess the impact of physical appearance on five dimensions of health-related QoL, namely social life, self-confidence, mood, energy, and attractiveness (19). By providing both a global score (Index) and specific scores for each of the five dimensions (Profile), the *BeautyQoL* questionnaire enables the assessment of each dimension contributing to the overall QoL of subjects having cosmetic concerns, as well as the potential benefits of cosmetic products.

Table II. Selection questions of skin pigmentary conditions.

Screening questions
Q1: Do you have any of the following problems? (yes/no) <ul style="list-style-type: none"> –Spots and/or freckles –Dilated pores, blackheads, shiny/oily skin, acne –Sagging, lack of elasticity –Wrinkles and lines –Dryness –Uneven skin tone, dullness –Rough skin texture
Q2: If yes in Q1 how much are you concerned about this problem? <ul style="list-style-type: none"> –very much –rather –not so much –not at all
Q3: If yes in Q1 How much do you think you can fix this problem by using skincare or makeup products? <ul style="list-style-type: none"> –very much –rather –not so much –not at all

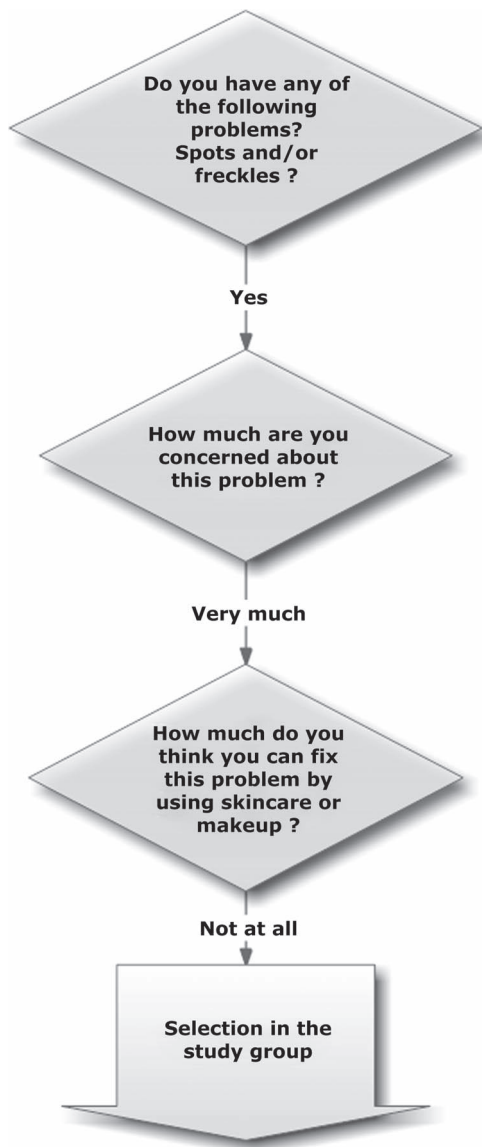


Figure 1. Screening flowchart for subject inclusion in group 1.

At baseline, each subject from both groups completed the *BeautyQoL* questionnaire and each subject was also assessed according to the following aspects:

- Sociodemographic questions (age, marital and family status, occupation, annual household income, and education).
- Skin concern questions.

The Japanese version of the *BeautyQoL* questionnaire (Version 3.0) was self-administered by participating subjects either online or using the paper-based version. The questionnaire was introduced with the following sentence: “All the following questions refer to changes that have appeared during the last 4 weeks in relation to your skin condition.”

Algorithmic scores of the five dimensions of the *BeautyQoL* instrument (social life, self-confidence, mood, energy, and attractiveness) were calculated for

each group and compared using analysis of variance or ANOVA and non-parametric statistical tests (Mann–Whitney tests).

Results

Mean ages of the subjects were 52.7 years (standard deviation [SD]: 15) for the study group and 42.1 years (SD: 12) for the control group ($p < 0.05$). All of the subjects in both groups lived in urban area and had either a secondary or tertiary education. Of the five dimensions assessed, only the score for the dimension “mood” appeared to be significantly lower in the group presenting facial dark spots, as compared with the control group ($p < 0.05$). The other four dimensions, where statistical significance was not reached, showed interesting divergent trends as subjects with dark spots compared with controls showed higher QoL in terms of social life and energy, although they showed lower scores regarding self-confidence and attractiveness. The results of this QoL assessment are provided in Figure 2.

In the group presenting facial dark spots, subjects concerned [119] and subjects less concerned [80] by facial dark spots were compared. The five dimensions and the global score showed that subjects concerned had lower scores than subjects less concerned, even if statistical significance was not reached. This is probably brought about by a lack of statistical power due to the small size of the subgroups. The results of this comparison are presented in Figure 3.

Discussion

Pigmentary disorders affect billions of patients globally and can cause significant cosmetic concerns (6,20). Skin being one of the most important components of an individual’s physical appearance, cosmetic pigmentary disorders may have psychological consequences and may negatively impact

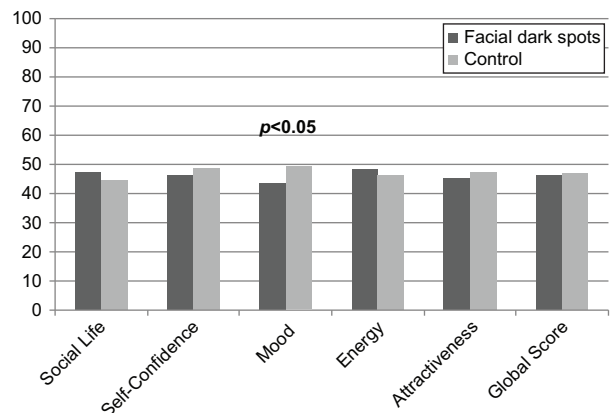


Figure 2. Scores of the 5 *BeautyQoL* dimensions + global score assessed in subjects with “facial dark spots” versus the control group in Japan.

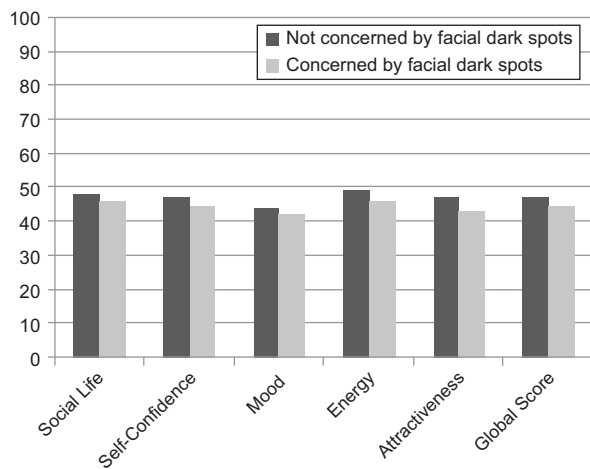


Figure 3. Scores of the 5 *BeautyQoL* dimensions + global score assessed in subjects concerned versus less concerned by “facial dark spots.”

different dimensions of the QoL (7,14,15,21,22). Hence, although skin imperfections may be perceived as unimportant, more or less noticeable skin symptoms or cosmetic concerns may actually interfere with social life, work, and relationships (12,16). This is because pigmentary disorders often include visible symptoms where people get repeatedly glared at or are even avoided. In some cultures, a different skin appearance may also lead to social stigmatization (15). Consequently, most pigmentary disorders should be considered cosmetically important given that they can adversely impact the QoL of affected individuals (14,15,20,23–25).

In a study published by Taylor et al. in 2008 (14), 140 subjects with pigmentary disorders were asked to fill out a questionnaire to assess the impact of their skin condition. The results showed that 47.3% felt self-conscious about their skin, 21.8% felt that others were focusing on their skin, 32.7% felt unattractive because of their skin, 32.7% put effort into hiding pigment changes, and 23.6% felt that their skin affected their activities. Another recent study conducted in China showed that patients with skin discoloration had experienced significantly impaired health-related QoL as well as unstable marital relationships (3).

These findings address the importance of assessing the social, mental, and emotional dimensions of QoL in individuals presenting pigmentary disorders (12,21,25). This *BeautyQoL* study also shows unexpected results, such as the fact that subjects with dark spots seem to show higher QoL in terms of social life and energy. Since no significant differences have been established, the observed differences can be interpreted by statistical errors. Nonetheless, further studies would be interesting to investigate this particular aspect, as small visible lesions could potentially incite subjects to cope with them in a positive way. With the development of the *BeautyQoL*

international instrument specifically designed to assess the impact of physical appearance and cosmetic products on QoL, such dimensions can now be assessed in a scientific and robust manner (19). Importantly, the *BeautyQoL* questionnaire enables calculating a global score (Index) and specific scores for each of the five dimensions (Profile) affecting the QoL, namely social life, self-confidence, mood, energy, and attractiveness, and can therefore assess the impact on each specific dimension.

The results of this pilot study conducted in Japan establish that facial dark spots, a common pigmentary disorder in Japan, seem to affect the dimension “Mood” of women presenting this pigmentary condition, while it has no significant impact on the four other dimensions. Nevertheless, all dimensions of QoL seemed to be impacted in subjects “concerned” versus “less concerned” by dark spots, even if they presented similar skin conditions. No statistically significant differences have been established, most probably because of the small differences in the number of subjects. The results also suggest that these subjects may have a higher self-appraisal for aspects relevant to social life and energy, and lower self-appraisals relevant to self-confidence and attractiveness. From a statistical viewpoint, all results—significant or not—showed rather small differences between the two groups for the five dimensions, presumably because skin imperfections and cosmetic concerns may be perceived by some as being of minor consideration. However, assessment with *BeautyQoL* would be more relevant if a particular procedure can improve the QoL. Nonetheless, given its multidimensional attributes, the *BeautyQoL* instrument was capable of showing that pigmentary disorders such as facial dark spots had a significant negative impact on the “Mood” dimension of Japanese women.

Since most of potential differences in QoL are small, only a very sensitive and specific instrument such as *BeautyQoL* would be able to capture such minor changes. Further comparative studies using a controlled randomized design would be necessary to confirm these findings and test various therapeutic approaches, including cosmetic camouflage and dermatological procedures, not only from an efficacy and safety perspective, but also to scientifically assess their impact on QoL using a robust, specially designed, and internationally validated instrument. Hence, QoL dimensions should be increasingly investigated in more clinical trials assessing new cosmetic products and interventions.

Conclusions

Pigmentary disorders are very frequent in Japanese skin, leading to the development of specific dermo-cosmetic products addressing this issue. This study conducted on Japanese women confirms that com-

mon pigmentary disorders such as facial black spots may negatively impact QoL, also confirming the role of physical appearance in well-being and self-esteem.

Declaration of interest: The authors report no declarations of interest. The authors alone are responsible for the content and writing of the paper.

References

1. Patzer GL. Improving self-esteem by improving physical attractiveness. *J Esthet Dent*. 1997;9:44–46.
2. Tanioka M, Miyachi Y. Camouflage for vitiligo. *Dermatol Ther*. 2009;22:90–93.
3. Wang KY, Wang KH, Zhang ZP. Health-related quality of life and marital quality of vitiligo patients in China. *J Eur Acad Dermatol Venereol*. 2011;25:429–435.
4. Zip C. The impact of acne on quality of life. *Skin Therapy Lett*. 2007 Dec-2008;12:7–9.
5. Tager MJ. Pigmentation treatments for Asian skin. *The Asian aesthetic guide*. Spring; 2011. <http://www.miinews.com>
6. Grimes PE. Disorders of pigmentation: Global issues of major cosmetic concern. *West J Med*. 1998;169:226–227.
7. Grimes PE. Management of hyperpigmentation in darker racial ethnic groups. *Semin Cutan Med Surg*. 2009;28:77–85.
8. Goh CL, Ang P, Chua SH, Khoo SW. A clinical-pictorial classification of acquired facial cosmetic pigmentary disorders. *Dermatol Bulletin*. 2003;14:18–20.
9. Chang JH, Lee SH, You CS, Park BJ, Kim KH, Park KC, et al. Cutaneous photodamage in Koreans: Influence of sex, sun exposure, smoking and skin colour. *Arch Dermatol*. 2001;137:1043–1051.
10. Roh KY, Kim D, Ha SJ, Ro YJ, Kim JW, Lee HJ. Pigmentation in Koreans study of the differences from Caucasians in age, gender and seasonal variations. *Br J Dermatol*. 2001;144:94–99.
11. Lin JY, Chan HH. Pigmentary disorders in Asian skin: Treatment with laser and intense pulsed light sources. *Skin Therapy Lett*. 2006;11:8–11.
12. Schmid-Ott G, Steen T. Skin disorders and quality of life. In: Stone JH, Blouin M, editors. *International encyclopedia of rehabilitation*. 2012. [cited 2014 Aug 1]. Available from: <http://cirrie.buffalo.edu/encyclopedia/en/article/152/>
13. Grimes PE. Melasma. Etiologic and therapeutic considerations. *Arch Dermatol*. 1995;131:1453–1457.
14. Taylor A, Pawaskar M, Taylor SL, Balkrishnan R, Feldman SR. Prevalence of pigmentary disorders and their impact on quality of life: A prospective cohort study. *J Cosmet Dermatol*. 2008;7:164–168.
15. Parsad D, Kumarasinge SPW. Psycho-social implications of pigmentary disorders in Asia. *PASPCR Commentary* 2006; Oct 1 [cited 2014 Aug 1]. Available from: <http://www.paspcr.org/commentaries/2006-10-commentary.pdf>
16. Porter J, Beuf AH, Nordlund JJ, Lerner AB. Psychological reaction to chronic skin disorders: A study of patients with vitiligo. *Gen Hosp Psychiatry*. 1979;1:73–77.
17. Van der Veen JP. Pigmentary disorders in Western countries. *Dermatol Clin*. 2007;25:449–455.
18. Halder RM, Nootheti PK. Ethnic skin disorders overview. *J Am Acad Dermatol*. 2003;48:S143–S148.
19. Beresniak A, DeLinares Y, Krueger GG, Talarico S, Tsutani K, Duru G, Berger G. Validation of a new international quality of life instrument specific to cosmetics and physical appearance: *BeautyQoL* Questionnaire. *Arch Dermatol*. 2012;148:1275–1282.
20. Davis EC, Callender VD. Postinflammatory hyperpigmentation: A review of the epidemiology, clinical features and treatment options in skin of color. *J Clin Aesthet Dermatol*. 2010;3:20–31.
21. Basra MK, Shahrukh M. Burden of skin diseases. *Expert Rev Pharmacoecon Outcomes Res*. 2009;9:271–283.
22. Quandt SA, Schulz MR, Vallejos QM, Feldman SR, Verma A, Fleischer AB, et al. The association of dermatologist-diagnosed and self reported skin diseases with skin-related quality of life in Latino migrant farmworkers. *Int J Dermatol*. 2008;47:236–241.
23. Ortonne JP, Passeron T. Melanin pigmentary disorders: Treatment update. *Dermatol Clin*. 2005;23:209–226.
24. Taylor S, Grimes P, Lim J, Im S, Lui H. Postinflammatory hyperpigmentation. *J Cutan Med Surg*. 2009;13:183–191.
25. Grimes P, Nordlund J, Pandya AG, Talor S, Rendon M, Ortonne JP. Increasing our understanding of pigmentary disorders. *J Am Acad Dermatol*. 2006;54:S255–S261.