White Beauty: The Moderating Role of Social Media Addiction on Social Comparison and Skin Tone Satisfaction

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: To examine the prevalence of skin tone dissatisfaction among Malaysian young adults and to explore the associations between social media addiction, social comparison, and skin tone satisfaction.
Study Design: Cross-sectional survey design.
Place and Duration of Study: Universiti Pendidikan Sultan Idris, Perak, Malaysia, between December 2019 to January 2020
Methodology: Around 414 university students have partaken in an online survey consisting of a demographic questionnaire, Skin Colour Satisfaction Scale (SCSS), Upwards/Downwards Physical Appearance Comparison Scale (UPACS/DACS) and Bergen Social Media Addiction Scale (BSMAS).
Results: Descriptive analysis shows that the prevalence of skin tone satisfaction among Malaysian young adults is on a moderate level ($M = 5.791$, $SD = 1.630$), and there is a significant difference in satisfaction level among those who never tried using skin lightening products versus those who have experience in using those products, $t (410.808) = -3.850$, $p < .001$. Multivariate analysis shows that skin tone satisfaction is significantly associated with upwards social comparison ($\beta = -.45$), but not with downwards social comparison and social media addiction. Multigroup invariance analysis showed that social media addiction significantly weakens the relationship between

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upwards social comparison and skin tone satisfaction but has no effect on the relationship between downwards comparison and skin tone satisfaction.

Conclusion: Malaysian young adults are moderately satisfied with their skin tone, and upwards comparison can significantly influence skin tone satisfaction. The implications of this study are discussed in light of recommendations for policymakers to control the marketing of harmful skin lightening products online.

1. INTRODUCTION

For Malaysian's society, being light skin are considered a beauty ideal based on numerous skincare products that were marketed targeting these criteria [1,2]. Interestingly, recent years have witnessed numerous reports in the news regarding harmful skin lightening products being sold in the market and the adverse effects of using them [3,4,5,6]. Numerous campaign and public service announcements have also been made to discourage people from buying and using skin lightening products that promised extreme results in the shortest turnover rate [7,8]. Ministry of Health Malaysia (MOH), for instance, persistently kept track of locally branded companies that produced and sold fast turnover whitening products, and when pharmaceutical tests were conducted on these products, ever so frequently these products were proven to contain harmful ingredients [9,10,11].

Many cases have been reported in national media about the adverse effects of using such products, which include skin cancer, thinning of the skin, cataracts, damage on the liver and kidneys, osteoporosis, nerve damage, and not to be excluded psychological disruption [12,13,14,15]. Despite this, these harmful products still can be seen being marketed and sold in public places and based on the high number of demands on skin lightening products in Malaysia; it shows that people are willing to risk their health in exchange to lighten up their natural skin tone [1,2,12,16,17,18]. Moreover, past researches also showed that young adult individuals whose age ranges from 20 to 30 years old are more prone to use skin bleaching products [19,20,21,22]. These facts raise the question of how unsatisfied are Malaysians with their natural skin tone, to which they are inclined to use extreme products in order to become whiter?

As mentioned in [23], social media could provide vast opportunities for social comparison to occur because of its users' tendencies to compare themselves with other people on dimensions that are relevant to self-worth, for example, attractiveness or social connectedness [23]. Due to social media distinctive features where it encompasses elements of interactivity and connectedness that enable users to communicate with peers and/or public figures virtually, excessive social media users are prone to perceive, compare and internalize cultural beauty ideals as shown on their screen [24,25]. A survey conducted by We Are Social revealed that as of January 2020, out of 32.16 million Malaysians in total population, 26 million (81%) of them were active social media users since April 2019 [26]. By "active social media users", it means that the social media users have 100% visited and used social media platforms in the past month. Every Malaysians were also found to spend an average 2 hours and 45 minutes on social media daily, with the most used social media platforms are YouTube (93%), What's App (91%), Facebook (87%), Instagram (72%), and FB Messenger (63%) [26].

The tripartite Influence Model [27] explains three factors that can contribute to a person's body image, namely family, friends, and media. These three factors affect body image through two mechanisms; they lead the individual to internalize cultural beauty ideals and later encourage appearance-based social comparison with other people in their society. In the context of skin tone satisfaction, exposure to light skin tone ideals through social media platforms can lead to the internalization of beauty ideals and encourage appearance comparisons, hence leading to skin tone dissatisfaction.

Multiple past researchers have found significant relationships between social comparison, social media use and body image concerns. Findings from a meta-analysis review conducted by [28] on 63 quantitative studies have shown a significantly positive albeit small relationship between social media use and body image

concern. Past studies suggest that exposure to beauty ideal images (as found in social media) led to higher body and facial dissatisfaction [29], appearance comparison was found to be a significant predictor to increment in body dissatisfaction and decrement in body appreciation [30], and overall appearance satisfaction was found decreasing after the participants were exposed to idealized images [31].

In addition, people are bound to compare themselves with their preferred and selected body ideals when they are using social media [32] regardless of the context of body ideals images, such as fitspiration (fitness-inspiration) images [33], celebrity images [34], and enhanced (i.e., with makeup and digitally altered) images [35]. Social media usage has also shown positive relationships with body image concerns, and this relationship was mediated by their users' tendencies to compare their appearance with peers that they saw on social media [36]. Moreover, past studies have also shown a positive relationship between time spent on social media and social comparison, specifically in terms of appearance comparison [37,38,39]. On the other hand, the upwards social comparison has been reported to display a significant relationship to body image concerns more rather than downwards comparison [29,34,36,40,41].

Based on findings from the literature reviews, we build a hypothesized model on the relationships of social media addiction, social comparison, and skin tone satisfaction. In this study, we want to evaluate the prevalence of skin tone satisfaction among Malaysian young adults, to examine the influence of social media addiction on skin tone satisfaction, to examine the influence of social comparison on skin tone satisfaction, and to investigate the moderating role of social media addiction on the relationship between social comparison and skin tone satisfaction. This model consisted of five hypotheses as follows:

H1: Social media addiction can significantly predict skin tone satisfaction

H2: Upwards social comparison can significantly predict skin tone satisfaction

H3: Downwards social comparison can significantly predict skin tone satisfaction

H4: Social media addiction significantly moderate the association between upwards comparison and skin tone satisfaction

H5: Social media addiction significantly moderate the association between downwards comparison and skin tone satisfaction

2. METHODS

2.1 Design of Study

A cross-sectional, correlational survey design was implemented in this research.

2.2 Sample

University students from Universiti Pendidikan Sultan Idris (UPSI), Perak, were conveniently sampled in this study. In order to protect the cohesiveness and homogeneity of the data, the researcher has dictated two inclusion criteria for the respondents. The first one was that prospect participants must be of individuals whose age ranges from 18 to 35 years old; therefore, those who are below or exceed the age range will be excluded from this study. Another criterion was that prospect respondents must be of Malaysian nationality as this study is aimed towards the Malaysian population.

A total of 431 students have participated in this study. However, after some outliers were removed, the total participants were reduced to $N = 414$. The age of participants ranged from 18 to 35 years old ($M = 22.88$, $SD = 2.92$). Around 33% of the participants are male, while 67% are female. In terms of race, 75% of participants are Malay, 6% are Chinese, 7% are Indian, and 12% are of other races. The participants reported having spent from 0 to 24 hours on social media daily, with an average of 3 hours 41 minutes ($SD = 3$ hours 28 minutes) spent on social media per day.

Two hundred and twenty participants (53%) claimed to have experience in using skin lightening products, while 194 (47%) have never tried using skin lightening products. Among the 220 respondents who have experience in using skin lightening products, 68% of them reported that they are still using the products for the time being. The age at which they have started to use skin lightening products ranges from 11 to 30 years old ($M = 17.89$, $SD = 3.59$). In terms of the brand of skin lightening products that they have

tried, the response ranged from 1 to 15 brands (*M* = 3.04, *SD* = 2.32). For the duration of them using skin lightening products, some of the respondents reported they have only started using it recently (11%), while some have been using it for a few weeks (8%); for a few months (30%); for over a year (20%); and for many years (31%). They also reported the reason for their skin lightening products uses are to lighten up their skin tone (32%), to fade scars (28%), to treat sunburnt skin (30%), just want to try it for the first time (8%) and other reasons (2%).

2.3 Measures

A full set of questionnaires consists of four instruments: demographic information, Skin Color Satisfaction Scale (SCSS), Bergen Social Media Addiction Scale (BSMAS) and Upwards Physical Appearance Comparison and Downwards Physical Appearance Comparison Scale (UPACS/DACS).

2.3.1 Demographic Information

This section collected some background information about the participants. The information includes age, gender, race.

2.3.1.1 Social media usage

This section collected basic information on the hours that participants usually spent on their social media platforms daily and how frequent they posted pictures of themselves on social media.

2.3.1.2 Skin lightening behaviours

This section collected respondents experience in using skin lightening products and skin lightening behaviours for those who have experience in using skin lightening products. For skin lightening behaviours, we asked several questions relating to the history of respondents' skin lightening products usage. The questions include "Are you still using skin lightening products?", "At what age did you start using skin lightening products?", "How many brands (of skin lightening products) have you tried before this?", "How long have you been using skin lightening products?" and "What is the main purpose for you using skin lightening products?".

2.2.2 Skin Color Satisfaction Scale (SCSS)

We adapted the 4-items version of Skin Color Satisfaction Scale (SCSS) developed by [42] to

measure skin tone satisfaction in this study [43]. In the original instrument, the term "African-American" was used as a benchmark for the prospective participants to compare their skin colour. For this research, we have replaced the term "African-American" with "Asians" to specifically cater for all races in the multiracial Malaysian population. All items were rated on a 9-point Likert scale ranging from "1 = extremely dissatisfied" to "9 = extremely satisfied" for item 1, and "1 = strongly disagree" to "9 = strongly agree" for items 2, 3, and 4 [42,44]. With a mean score ranging from 1 to 9, higher scores will indicate higher satisfaction with one's own skin tone [42]. In this study, the 4-items SCSS reported a good reliability score of Cronbach's alphas, *α* = .84.

2.2.3 Bergen Social Media Addiction Scale (BSMAS)

We adopted Bergen Social Media Addiction Scale (BSMAS) developed by [45] to measure social media addiction. The scale consisted of 6 items and used a 5-point Likert scale ranging from "Very Rarely" to "Very Often" and asked about the respondent's relationship with social media over the course of a year. Each item represented each component in behavioural addiction theory: salience, craving/tolerance, mood modification, relapse/loss of control, withdrawal, and conflict/functional impairment [46,47]. The total score ranged from 6 to 30, and a higher score represents a higher level of social media addiction, wherein scores above 19 are considered as addicted to social media [46]. In this study, BSMAS showed a reliability score of *α* = .77.

2.2.4 Upwards Physical Appearance Comparison Scale and Downwards Physical Appearance Comparison Scale (UPACS/DACS)

We adopted Upward and Downward Physical Appearance Comparison Scales (UPACS/DACS) developed by [48] to measure social comparison in the context of physical appearance comparison. The instrument consists of two subscales which measured individual's tendency to compare themselves with people whose appearance they deemed as better than themselves (Upward Physical Appearance Comparison Scale (UPACS)) or those whose appearance they deemed as lesser than themselves (Downward Physical Appearance

3. RESULTS AND DISCUSSION

3.1 Normality tests, outliers, and descriptive statistics

We tested the univariate normality of the variables by plotting histograms and Gamma plots. The plots showed that all variables were normally distributed. We tested for multivariate normality by calculating and plotting Mahalanobis distance and chi-square values of the data on a scatterplot. There are some multivariate outliers present in the plot. After the outliers were removed, multivariate normality was achieved by the current sample data. The current total sample has been reduced to $N = 414$. Table 1 shows the descriptive statistics and intercorrelations among all variables for the current sample.

3.2 Skin Tone Satisfaction among Participants

According to the scoring manual by [42], the mean score for the Skin Color Satisfaction Scale (SCSS) ranges from 1 to 9, wherein a higher mean score indicates higher skin tone satisfaction. Based on Fig. 1, the participants have moderately high satisfaction with their skin tone. Noticeably, participants who have experience in using skin lightening products (n = 220) reported lower skin tone satisfaction compared to those who never tried using skin lightening products (n = 194). The difference in these mean scores has prompted us to conduct an independent t-test to test whether the difference is significant or not. Results revealed that the mean difference between both groups is significant with t (410.808) = -3.850, $p < .001$. This shows that participants who never tried using skin lightening products are feeling more satisfied with their natural skin tone, hence they have no tendency to try lightening up their skin tone. On the other hand, those who have high dissatisfaction with their skin tone are prone to use products to lighten up their skin tone.

Comparison Scale (DACS)) respectively. UPACS consisted of 10-items, and DACS consisted of 8 items. Both subscales use a 5-point Likert scale for measurement ranging from "1 = Strongly disagree" to "5 = Strongly agree". A higher mean score of each scale indicates a greater tendency to compare themselves against more attractive targets (UPACS) or against less attractive targets (DACS) [48]. In this study, UPACS showed good reliability of $α = .92$; meanwhile DACS also showed good reliability of $α = .93$.

2.4 Procedure

We used an online survey platform as a medium to collect respondents' responses. We publicized this study using digital advertisements by posting posters and announcements through the university's public social media platforms and intranet mailing system. Through this publicity, we invited Malaysian young adults aged 18-35 years old to participate in the survey. If they are interested, they can start participating by clicking on the questionnaire's link that was provided together with the advertisements or by scanning the QR code attached to the poster. This link of the survey was closed after a 6-weeks period when an adequate number of respondents had been achieved.

2.5 Data Analysis

IBM Statistical Package for Social Science (SPSS) version 23 [49] and its module package, Analysis of Moment Variance (AMOS) version 22 [50], was used to analyze the data obtained in this research. We used descriptive statistical analysis to describe the demographic factors of the participants and the prevalence of skin tone satisfaction among the participants. Covariance-based structural equation modelling analysis using maximum likelihood estimation was implemented to test the hypotheses.

Table 1. Descriptive statistics and correlation coefficients for all variables

	M	*SD*	Skewness	Kurtosis	Pearson's correlation, *r*			
					STS	SMA	UC	DC
STS	5.791	1.630	-0.065	-0.229	1	-.163**	-.393**	-.220**
SMA	3.038	0.779	-0.359	0.062	-.163**	1	.403**	.299**
UC	3.103	1.012	-0.267	-0.605	-.393**	.403**	1	.553**
DC	2.413	1.000	0.379	-0.498	-.220**	.299**	.553**	1

*STS = skin tone satisfaction, SMA = social media addiction, UC = upwards comparison, DC = downwards comparison, ** = significant at p < .01 (two-tailed)

Mean skin tone satisfaction score according to those who have experience
in using skin lightening products, those who did not, and all participants
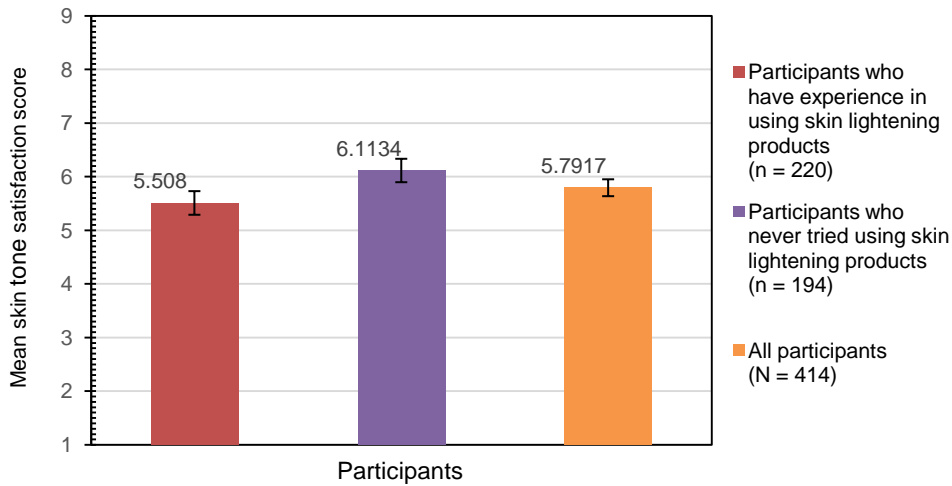

Fig. 1. Mean score of skin tone satisfaction among participants (with 95% confidence interval)

3.3 Preliminary analyses of the measurement model

Pooled-confirmatory factor analysis was conducted to assess the fitness of the model. The result showed that the model has a good fit: χ^2 (246) = 598.348, χ^2/df = 2.432, p = .000, CFI = 0.940, TLI = 0.933, IFI = 0.941, RMSEA = 0.059 (90% CI = 0.053, 0.065), SRMR = 0.055, PClose = .080, in which all goodness-of-fit indices has surpassed the recommended cut-off values [51,52,53].

The model also presented good composite reliability (CR value ranges from 0.613 to 0.970) and discriminant validity ($\sqrt{AVE}$ value ranges from 0.590 to 0.854). For convergent validity, the AVE value of all constructs ranges from 0.348 to 0.729, in which social media addiction has obtained an AVE value less than 0.5 to be considered as achieving convergent validity [53]. However, according to [54], even if the AVE < 0.5, provided that the CR value of the construct is higher than 0.6 (in which the CR value of social media addiction is 0.613), the convergent validity of the construct is still considered as adequate.

Since the data for the present study were collected from a single sample source using one survey set at the same time, there is a potential for the data set to be distorted by the common method bias effect (CMB) [55,56]. Therefore, two tests were conducted to check for CMB threats in the current data. Harman's single-factor test was conducted first. A cumulative variance exceeding 50% would indicate the presence of CMB [55,56]. The current data showed a cumulative variance of 32.275%.

Reference [55] recommended a common latent factor approach to test for CMB in SEM analysis. A difference in regression weights that exceeds .200 between a model with a common latent factor and a model without would indicate the presence of CMB [55]. A pooled-CFA was conducted on the model to record the regression weights, and then this step was repeated again after including a common latent factor. The regression weights in both models are compared, no dominant factor (difference >.200) has emerged and thus confirming that CMB is not a threat to the current dataset.

3.4 The Associations of Social Media Addiction, Upwards Comparison, and Downwards Comparison with Skin Tone Satisfaction

In this model, upwards comparisons, downwards comparisons, and social media addiction are exogenous variables, and skin tone satisfaction is an endogenous variable. The model is recursive and over-justified. Results on goodness-of-fit (GOF) indices showed that the model has acceptable model fit, with χ^2 (246) = 598.348, χ^2/df = 2.432, CFI = 0.940, TLI = 0.933, IFI = 0.941, RMSEA = 0.059, 90% CI [0.053, 0.065], SRMR = 0.055, PClose = 0.08. The squared multiple correlation (R^2) coefficient for

skin tone satisfaction is 0.179 with medium effect size, f^2 = 0.218, which means social media addiction, upwards comparison, and downwards comparison can only explain 17.9% variance in skin tone satisfaction. Table 2 shows the regression outputs for all direct effect relationships.

Based on the outputs, social media addiction does not significantly influence skin tone satisfaction. This finding is rather disappointing as we have expected that continuous exposure to social media content - which is warranted through social media addiction - would affect one's skin tone satisfaction, as reported in earlier studies [24,25,41]. A possible explanation for this insignificant result might be that because of the vague context of social media platforms that were being measured in the current study. In this study, we did not emphasize on the type of social media platforms used by the participants. Since the most-used social media platforms in Malaysia is YouTube and WhatsApp [26] and Malaysians' motivation to stay online was mostly attributed to staying up to date with current events/latest news and keeping in touch with friends [26], it can be deduced that the most-used social media platforms and social media usage in Malaysia did not revolve around photo viewing or sharing platforms, e.g., Instagram and Pinterest, which were found to related with body image and dissatisfaction [24,25,41]. In other words, less use of photo-sharing social media platforms decreases participants' exposure to beauty ideals on their screen and therefore, no relationship would occur between excessive social media usage and skin tone satisfaction among participants.

In terms of social comparison, upwards comparison presented a significant effect on skin tone satisfaction, which is consistent with result findings from multiple previous studies [29,34,40,41]. However, the magnitude of this effect was small, indicating that although upwards comparison can significantly affect skin

tone satisfaction, it did not produce that much of an impact on skin tone satisfaction. The direction of this effect is negative, indicating that the increment of upwards comparison would decrease the satisfaction that one might feel about their skin tone. This finding corroborates the findings of [30] and the theory of social comparison by [57]. This result signifies that as participants comparing themselves against someone who is more attractive, they are would feel less satisfied with their own features. As beauty ideals in Malaysia is light skin tone, those who have higher internalization of light skin ideals would feel more impacted by the upwards comparison, where they would compare themselves with someone who is ideally beautiful (having lighter skin tone). Thus, they would feel greater dissatisfaction with their skin tone, especially if they perceived that their skin tone is darker than ideal skin tone.

Findings from past studies showed that downward comparison also could produce a significant albeit lesser effect on skin tone satisfaction compared to upward comparison [34,36,40,41]. Contrastingly, the finding from the current study showed that there was no significant effect of downward comparison on skin tone satisfaction among participants. To explain this finding, we will relate with the level of skin tone satisfaction of the participants. As reported previously, the participants are moderately satisfied with their natural skin tone. This indicates that internalization of light skin ideals is also moderate, since participants are not extremely dissatisfied with their natural skin tone. As downwards comparison revolves around comparison against someone who is less attractive than the participants, comparison with someone who is darker than the ideal skin tone do not produce an effect on participants' perceived skin tone satisfaction. In essence, they feel indifferent about their skin tone when they compare themselves with darker skin tone people. As such, hypothesis H2 is supported, but H1 and H3 are not supported.

Table 2. Regression outputs for direct paths in the model

Path of hypothesis testing			β	B	S.E.	C.R.	p-value	f^2
H1	Social media addiction	→ Skin tone satisfaction	.048	.083	.107	.772	.440	.002
H2	Upwards comparison	→ Skin tone satisfaction	-.448	-.768	.125	-6.130	***	.015
H3	Downwards comparison	→ Skin tone satisfaction	.011	.014	.080	.177	.859	.000

*β = standardized regression coefficients, B = regression coefficients, S.E. = standard errors, C.R. = critical ratio, *** = significant at p < .001, f^2 = effect size*

3.5 The Moderating Effect of Social Media Addiction on Associations of Upwards and Downwards Comparison with Skin Tone Satisfaction

To test for moderating effect in hypotheses H4 and H5, we performed a multiple group invariance analysis using SEM. The moderating variable of this research, which is social media addiction, is divided into two groups of datasets: the non-addicted to social media ($n = 213$) and addicted to social media ($n = 201$). This grouping is made based on the cutoff point of the instrument itself, in which scores of 19 and higher are deemed as being addicted to social media [46,58].

The model was run, and the chi-square value and degree of freedom are summarized and compared in Table 3. If the variance in $\Delta\chi^2$ in both unconstrained and constrained models is larger than 3.841 and the variance of df is at least 1, it can be deduced that the models are significantly variant at $p < .05$ [59]. The results yielded by the multigroup analysis showed that all models presented $\Delta\chi^2$ larger than 3.841 and *df*'s difference of 1, marking that social media addiction moderates the relationship between social comparison and skin tone satisfaction. This result corroborates the findings found in past studies [32,33,34,35].

Table 4 shows the regression outputs of direct paths in both moderating groups. Upwards comparison and skin tone satisfaction presented a significant relationship in both moderating groups, indicating that a partial moderation effect of social media addiction has taken place [59]. The relationship between upwards comparison and skin tone satisfaction has been discussed on H2, and with the addition of social media addiction as moderator, the results are expected. Interestingly, the non-addicted to social media group was found to exhibit the stronger effect of upwards comparison towards skin tone satisfaction (a negative relationship) compared to the addicted to social media group. This indicates that participants who tend to compare themselves with more attractive people have greater dissatisfaction with skin tone, and this relationship is stronger among those who are not addicted to social media, compared to participants who are addicted to social media. To explain this, we would like to revisit the facts that the most used social media platforms by Malaysians are YouTube and WhatsApp, in which both are not photo-sharing oriented platforms [26]. As individuals are prone to

compare themselves through images found on social media [29,31,32], these two platforms provide limited exposure of beauty ideal images to its users. Therefore, those who are addicted to social media and prone of using these two platforms have lesser chance to be exposed to light skin tone ideal images. We think this is the most probable explanation to understand the reason as to why those who are not addicted to social media have a higher tendency to make upwards comparison that leads to lower skin tone satisfaction, compared to those who are addicted to social media.

Downwards comparison and skin tone satisfaction, on the other hand, are not significantly associated in both moderating groups, indicating social media addiction did not moderate this relationship regardless of significant chi-square difference in both groups. As discussed on H3, no significant relationship occurred between downwards comparison and skin tone satisfaction due to moderate level of skin tone satisfaction and internalization of light skin ideal. Therefore, even with the addition of social media addiction as moderator, the relationship is still not significant since Malaysians are not addicted to photo-sharing platforms that can guarantee constant exposure to social media addiction. Based on this result, hypothesis H4 is supported, but H5 is not supported.

3.6 Implications, Limitations, and Recommendations for Future Studies

As this study is based in Malaysia and catered to the Malaysian population only, it is then not applicable to be generalized with other nationalities who reside in Malaysia, nor other Malaysians who reside outside of Malaysia. The reason is that we intended to preserve the cohesiveness of light skin beauty ideal among Malaysian society; therefore, this research would focus on the light skin ideal phenomenon experienced by Malaysians who reside in Malaysia only. Moreover, the current study has measured social media addiction as a univariate construct and did not put any emphasis on what aspect or context of the social media addiction or social media's function that can specifically contribute to the skin tone satisfaction or body image concern, and social comparison. We would like to suggest for further research to focus on specific domains of social media addiction or functions in a social media platform that could possibly be related to the aforementioned variables so that more meaningful findings could be obtained.

Table 3. Summary of chi-square difference and degree of freedoms

Path description		Moderator groups	Unconstrained model, χ^2	df	Constrained model, χ^2	df	$\Delta\chi^2$	Δdf
H4	Upwards comparison ↓ Skin tone satisfaction	Not addicted to social media	290.833	132	356.554	133	65.721	1
		Addicted to social media	249.786	132	540.184	133	290.398	1
H5	Downwards comparison ↓ Skin tone satisfaction	Not addicted to social media	290.833	132	315.244	133	24.411	1
		Addicted to social media	249.786	132	337.153	133	87.367	1

Table 4. Comparison of direct paths in both moderating groups of social media addiction

Paths description		Moderator groups	β	B	S.E.	C.R.	p-value	f^2
H4	Upwards comparison ↓ Skin tone satisfaction	Not addicted to social media	-.444	-.956	.226	-4.236	***	.167
		Addicted to social media	-.389	-.619	.138	-4.488	***	.028
H5	Downwards comparison ↓ Skin tone satisfaction	Not addicted to social media	.164	.251	.135	1.858	.063	.150
		Addicted to social media	-.103	-.126	.097	-1.297	.195	.007

*β = standardized regression coefficients, B = regression coefficients, S.E. = standard errors, C.R. = critical ratio, *** = significant at p < .001, f^2 = effect size*

Since this study studied only two directions of social comparison (upwards and downwards), it would be interesting to see whether lateral comparison would produce the same result. Perhaps future studies could also include this type of comparison as part of their research model. Finally, it should be acknowledged that there are some limitations that could occur from a survey and cross-sectional study. The findings from this study cannot be interpreted as representing the causal relationships between variables, and one-time data collection is not strongly supportive of remarking the prevalence of a phenomenon. Hence, future research using experimental and longitudinal research designs are encouraged in order for us to understand the causal mechanisms behind the potential associations between all constructs in this study and to test the strength and durability of a light skin internalization.

4. CONCLUSION

Taken together all findings, a moderate level of skin tone satisfaction was found among Malaysian young adults, and only upwards comparison has a significant effect on skin tone satisfaction. Social media addiction did not have a significant effect on skin tone satisfaction but somehow was proven to have a moderating effect on the relationship between social comparison and skin tone satisfaction. Social media addiction also found can significantly influence both types of social comparison and can predict skin tone satisfaction when mediated by upwards comparison. In sum, this study has achieved all objectives and answered all research questions. Like all studies, this study was not exempted from having possible limitations. It should be acknowledged that the findings from this study may be applied only to this sample population, and thus it is inaccurate to be generalized to represent the entire young adult population in Malaysia. Therefore, future studies need to be conducted to study these phenomena on a larger scale involving all Malaysian young adults in different states, organizations, industries, or sectors in order to make a more generalized finding.

It was hoped that the findings from the current study had added significant contributions to the

current literature. As mentioned previously, very few researchers have studied skin tone satisfaction in Malaysia, and very limited studies have correlated this phenomenon with social comparison and social media addiction in this country. The findings could serve as a new addition to the field of knowledge – whether it was in Malaysia, in Asia or worldwide. We anticipated that these results could enhance people's understanding of the reasons behind the popularity of skin lightening products and their massive market penetration, the effect of social comparison on skin tone satisfaction, and the role of social media usage in regard to this phenomenon. We also hoped that people could gain some insight into the extent of social media addiction, particularly in Malaysia and how it is capable of affecting our viewpoint towards other people and ourselves.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

Consent

We declare that informed consent was obtained from the participants (or other approved parties) for the publication of this research article.

Ethical approval

We hereby declare that this study has been examined and approved by the appropriate ethics committee and has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. We have obtained the approval to carry out human-subject research from the ethical board of Universiti Pendidikan Sultan Idris (UPSI) through the ethics committee of Research Management and Innovation Centre (RMIC) UPSI (reference code = 2019-0052-01).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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