Original Research Article
White beauty: The moderating role of social media addiction on social comparison and skin tone satisfaction

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 partook in an online survey consisted of 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 of 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 (β = -.45), but not with downwards social comparison and social media addiction. Multigroup invariance analysis showed that social media addiction significantly weakens the relationship between 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 policy makers to control the marketing of harmful skin lightening products online.

Keywords: skin tone satisfaction; social media addiction; social comparison; upwards comparison; downwards comparison; young adults

1. INTRODUCTION

For Malaysian's society, being light skin are considered as beauty ideals based on numerous skin care products that were marketed targeting on these criterions [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 announcement have also been made to discourage people from buying and using skin lightening products that promised extreme

results in shortest turnover rate [7][8]. Ministry of Health Malaysia (MOH) for instance, persistently keeping track on locally branded companies that produced and sell 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 medias 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 of 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?

According to Tripartite Influence Model [23], there are three factors that can contribute to a person's body image, namely family, friends, and media. These three factors affected body image through two mechanisms; they lead the individual to internalize cultural beauty ideals and later encouraging the appearance-based social comparison with other people in their society. The concurrent of these two mechanisms will lead the person to develop body image dissatisfaction, in which obsessive internalization of cultural body ideals and excessive appearance comparison will lead to greater body image dissatisfaction and therefore leading to unhealthy coping behaviors [23][24][25]. In the context of skin tone satisfaction, exposure to light skin tone ideals through social media platforms and sociocultural pressures can lead to internalization of beauty ideals and therefore leads to skin tone dissatisfaction.

Today, social media platforms are perceived as one of digital innovations that, as cited from [26], "can darken the future of individuals and humankind" (p.2). This opinion was stemmed from the increasing phenomenon of excessive social media use to the point of affecting normal life activities such as school [27][28] and job performance [29] as well as causing psychological disturbances [30][31]. Malaysians are not unfamiliar with excessive social media usage. As Yougov.com has reported in 2019, where it was revealed that one in every six Malaysians were spending more than nine hours a day on social media and although the average social media use is high, only 37% of social media users are aware that they have spent too much time on social media [32].

Social media addiction – also known as excessive social media use and problematic social media use – is defined as the preoccupation with social networking services driven by a strong motivation to consistently log on or to use social media excessively and thus subsequently impairing one's daily activities – affecting studies/job, interpersonal relationships, and psychological health and well-being – because of the amount of time and efforts spent in doing so [33]. 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 [34]. 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%) [34].

1.1 Literature review

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 [35] on 63 quantitative studies has shown a significantly positive albeit small relationship between social media use and body image concern, with type of social media use, body image dimension, country grouping and age were found to be significant moderators to this relationship. On the other hand, upwards social comparison has been reported to display significant relationship to body image concerns more rather than downwards comparison [36][37][38][39][40].

Reference [26] stated that 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. Past studies have found that social media addiction was linked to negative impacts on body images. 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 [41][42].

People who spent more time on social media was reported to experience more negative affect compared to those who were not on social media website [43]. Moreover, those who are prone to appearance comparison reported higher level of facial, hair and skin dissatisfaction after using social media compared to those who did not [43]. 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 [39]. Moreover, past studies also shown positive relationship between time spent on social media and social comparison specifically in terms of appearance comparison [44][45][46].

Exposure to beauty ideals in images on social media have been linked with increasing body dissatisfaction and internalization of body ideals. Studies such as conducted by [40] suggests that exposure to thin-ideal images (as found in social media) led to higher body and facial dissatisfaction compared to exposure to average image. Appearance comparison was found to be a significant predictor to increment in body dissatisfaction and decrement in body appreciation among women in Australia when they were shown pictures of ideal body images [47]. Similarly, overall appearance satisfaction was found decreasing after the participants were being exposed to idealized images compared to before exposure, and this change was not influenced by type of images shown (i.e., full body or face only) and type of comments accompanied the images (i.e., appearance-related comments or neutral comments) [48].

Reference [49] has found that regardless of any type of body ideals and preferences, people are bound to compare themselves with their preferred and selected body ideals. This finding was also supported in multiple researches with different context of appearance ideals, such as the fitspiration (fitness-inspiration) images [50], celebrity images [37], and enhanced (i.e., with makeup and digitally altered) images [51] which can be found abundantly online.

1.2 Research objectives and hypotheses

A large knowledge gap is present through the very limited studies that have investigated the prevalence of skin tone satisfaction in Malaysian setting. In addition, very limited studies in Malaysia have investigate socio-behavioral factors that may contribute to skin tone dissatisfaction experienced by Malaysian society, resembled by their tendency to lighten up

their natural skin tone. Although there are many studies that have studied relationships between social comparison and skin tone satisfaction, very limited studies have specifically studied the effect of two types of social comparison (upwards and downwards) on skin tone satisfaction, in which more focus has been put on the former rather than the latter. In addition, there are limited studies that have tested the role of social media addiction as one of influential factors to skin tone satisfaction. These are the gaps that the we intend to fill through this study.

Therefore, in this study, we aim 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. Based on findings in the literature reviews, we build a hypothesized model on the relationships of social media addiction, social comparison, and skin tone satisfaction is built. We propose that this model that could convey the effect of social media addiction and social comparison on skin tone satisfaction, based on findings reported by [40], [41], and [42]. Social media addiction is also hypothesized to be able to moderate the relationship between social comparison and skin tone satisfaction based on findings reported by [37], [49], [50], and [51]. This model consisted of five hypotheses that we want to test:

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. METHODOLOGY

2.1 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 university's public social media platforms and intranet mailing system. Through this publicity, we invited Malaysians young adults aged from 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 6-weeks period when adequate number of respondents have been achieved.

2.2 Measures

A full set of questionnaires is consisted 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).

2.2.1 Demographic Information

This section collected some background information about the participants. The information includes age, gender, race, how long do respondents usually spent on social media, their

experience in using skin lightening products, and skin bleaching behaviors for those who have experience in using skin lightening products. For skin lightening behaviors, 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 [52] to measure skin tone satisfaction in this study (Buchanan et al., 2008). The items are "How satisfied are you with the shade of your own skin color", "Compared to the skin color of members of my family, I am satisfied with my skin color", "I wish the shade of my skin was lighter", and "Compared to the skin color of other Asians, I am satisfied with my skin color". In the original instrument, the term "African-American" was used as a benchmark for the prospect participants to compare their skin color with. For this research, we have replaced the term "African-American" with "Asians" to specifically cater all races in 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 [52][53]. With mean score ranging from 1 to 9, higher scores will indicate higher satisfaction with one's own skin tone [52]. In this study, the 4-items SCSS reported good reliability score of Cronbach's alphas, $\alpha = .84$.

2.2.3 Bergen Social Media Addiction Scale (BSMAS)

We adopted Bergen Social Media Addiction Scale (BSMAS) developed by [54] to measure social media addiction. The scale consisted of 6 items and used 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 behavioral addiction theory: salience, craving/tolerance, mood modification, relapse/loss of control, withdrawal, and conflict/functional impairment [55][56]. Some of the items include "How often during the last year have you feel an urge to use social media more and more", and "How often during last year have you use social media to forget about personal problem". The composite score ranged from 6 to 30. The total score indicates the level of social media addiction that one might experience. Higher score represents higher level of social media addiction, and scores above 19 are considered as addicted to social media [55]. In this study, BSMAS shown reliability score of $\alpha = .77$.

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 [57] to measure social comparison in the context of physical appearance comparison. The instrument is consisted 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 Comparison Scale (DACS)) respectively. UPACS consisted of 10-items, and DACS consisted of 8 items. Both subscales use 5-point Likert scale for measurement ranging from "1 = Strongly disagree" to "5 = Strongly agree". The items of UPACS include "I tend to compare myself to people I think look better than me" and "When I see good-looking people, I wonder how I compare to them". On the other hand, the items of DACS include "I

compare myself to people less good looking than me" and "At parties I often compare my looks to the looks of unattractive people". Higher mean score of each scale indicates a greater tendency to compare themselves against more attractive targets (UPACS) or against less attractive targets (DACS) [57]. In this study, UPACS showed a good reliability of α = .92, meanwhile DACS also showed good reliability of α = .93.

2.3 Ethical Approval and Informed Consent

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). We equipped the survey with information sheet and informed consent form. The survey was designed to not collect and store any personal data of the respondents to preserve their confidentiality, and has provide ample clarification to the participants on the voluntary nature of the study. All participants have given their consent to participate in this study.

2.4 Participants

A total of 431 university students from Universiti Pendidikan Sultan Idris (UPSI), Perak were conveniently sampled in this study. However, after some outliers were removed, the total participants have been reduced to N = 414. The age of participants ranged from 18 to 35 years old (M = 22.88, SD = 2.92). The participants reported to have spent from 0 to 24 hours on social media daily, with an average 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 in 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 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%).

2.5 Data Analysis

IBM Statistical Package for Social Science (SPSS) version 23 and its module package, Analysis of Moment Variance (AMOS) version 22 were used to analyze the data obtained in this research. We used descriptive statistics 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.

3. RESULTS AND DISCUSSION

3.1 Normality tests, outliers, and descriptive statistics

We tested 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 has been achieved by the current sample data. The current total sample has been reduced to N = 414. Table 3.1 shows the descriptive statistics and intercorrelations among all variables for the current sample**.**

Table 3.1 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)*

3.2 Skin tone satisfaction among participants

According to the scoring manual by [52], the mean score for Skin Color Satisfaction Scale (SCSS) ranges from 1 to 9, wherein higher mean score indicates higher skin tone satisfaction. Based on Figure 3.1, 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. Result revealed that the mean difference between both groups is significant with t (410.808) = -3.850, $p < .001$.

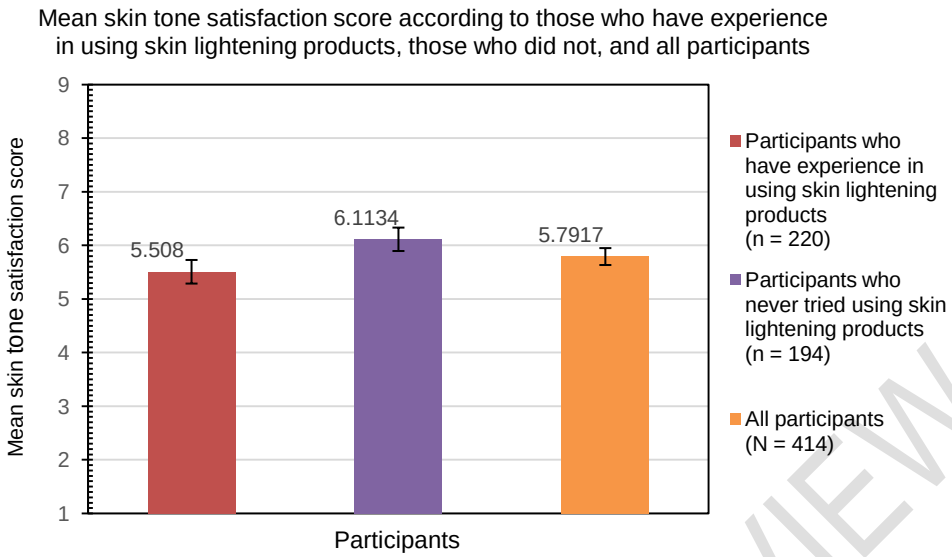

Fig. 1. Mean score of skin tone satisfaction among participants (with 95% confidence interval)

3.3 Preliminary analyses of 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: $\chi 2$ (246) = 598.348, $\chi 2/df$ = 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 [58][59][60].

The model also presented good composite reliability (CR value ranges from 0.613 to 0.970) and discriminant validity (√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 [60]. However, according to [61], 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 was 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 common method bias effect (CMB) [62][63]. Therefore, two tests were conducted to check for CMB threat in the current data. Harman's single-factor test was conducted first. A cumulative variance exceeding 50% would indicate the presence of CMB [62][63]. The current data showed a cumulative variance of 32.275%.

Reference [62] 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 [62]. 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 3.2 shows the regression outputs for all direct effect relationships.

Table 3.2 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*

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 [38][41][42]. A possible explanation for this might be that there is vague context of social media platform that was being measured in the current study. In this study, we did not put any specification or criterion on the type of social media platforms used by the participants. Since the most-used social media platforms in Malaysia is YouTube and WhatsApp [34] and Malaysians' motivation to stay online was mostly attributed to stay up to date with current events/latest news and keeping in touch with friends [32], 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 Facebook.

Thus, it is likely that even though social media addiction is prevalent among respondents, the type of social media platforms that Malaysians are commonly being addicted to – which are not photo sharing based platforms – cannot guarantee excessive exposure to light skin ideals images that could affect skin tone satisfaction. This could probably explain the lack of significant relationship between social media addiction on skin tone satisfaction found in the current study. Unfortunately, we cannot obtain more information from the data to further support this claim.

In terms of social comparison, upwards comparison presented significant effect on skin tone satisfaction, which is consistent with result findings from multiple previous studies [36][37] [38][40]. 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 [47] and the theory of social comparison by [64]. Stronger comparison with someone who are in better position than oneself would increase the dissatisfaction that a person might experience.

Findings from past studies showed that downward comparison also could produce significant albeit lesser effect to skin tone satisfaction compared than upward comparison [36][37][38][40]. Contrastingly, the finding from the current study showed that there was no significant effect of downward comparison on skin tone satisfaction among participants. We could not provide further explanation to this finding; however, it is explainable to relate this finding with the level of skin tone satisfaction of the respondents. As the participants are already moderately satisfied with their natural skin tone, therefore comparing themselves with someone who are less attractive than them might not produce that much of an effect on their skin tone satisfaction. In essence, downward comparison did not cause participants to feel more satisfied or less satisfied with their natural skin tone and hence, no significant associations can be found between these two variables. As such, hypothesis H2 is supported, but H1 and H3 are not supported.

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 hypothesis 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 cut-off point of the instrument itself, in which scores of 19 and higher are deemed as being addicted to social media [55][65].

The model was run, and the chi-square value and degree of freedom are summarized and compared in Table 3.3. If the variance in $\Delta\chi^2$ in both unconstrained and constrained model 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 $p < .05$ [66]. 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 [37][49][50][51].

Table 3.3 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
	Upwards comparison ↓	Not addicted to social media	290.833	132	356.554	133	65.721	1
H4	Skin tone satisfaction	Addicted to social media	249.786	132	540.184	133	290.398	1
	Downwards comparison ↓	Not addicted to social media	290.833	132	315.244	133	24.411	1
H5	Skin tone satisfaction	Addicted to social media	249.786	132	337.153	133	87.367	1

Table 3.4 shows the regression outputs of direct paths in both moderating groups. Upwards comparison and skin tone satisfaction presented significant relationship in both moderating groups, indicating that a partial moderation effect of social media addiction has taken place [66]. 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. Based on this result, hypothesis H4 is supported, but H5 is not supported.

The upwards comparison was found to have greater effects on skin tone satisfaction rather than downwards comparison in both groups. Significant effect of upwards comparison on skin tone satisfaction was present in both addicted and non-addicted groups. However, no significant effect of downwards comparison on skin tone satisfaction was found in both groups. Interestingly, non-addicted group was found to exhibit stronger effect of upwards comparison towards skin tone satisfaction (a negative relationship) compared to the addicted group. This indicates that people who are not addicted to social media have higher tendency to make upwards comparison, which then leads to lower skin tone satisfaction compared to those who are addicted to social media. Unfortunately, due to the lack of unique information about the social media addiction measured in the current study (e.g., which social media platforms did the participants mostly used, what do they mostly used social media for, and et cetera), we have no concrete evidence to further explain why the non-addicted group would produce stronger upwards comparison effects on skin tone satisfaction compared to the addicted group, which contrasted to what we have theorized in this study.

Table 3.4 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*

3.6 Implications, limitations, and recommendations for future studies

As this study is based in Malaysia and catered to Malaysian population only, it is then not applicable to be generalized with other nationalities whom residing in Malaysia, nor other Malaysians whom residing 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 whom residing 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 related to the aforementioned variables so that more meaningful findings could be obtained.

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 study 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 to remark 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, skin tone satisfaction was found moderately prevalent among Malaysian young adults, and only upwards comparison has significant effect on skin tone satisfaction. Social media addiction did not have 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 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 have added significant contributions to the current literature. As mentioned previously, very few researches 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 on the reasons behind the popularity of skin lightening products and its 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 can gain some insight on the extent of social media addiction particularly in Malaysia and how it is capable to affect our viewpoint towards other people and ourselves.

CONSENT

We declare that informed consent was obtained from the participants (or other approved parties) for 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 DISCLAIMER:

Authors have declared that no competing interests exist. 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.

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