Effect of body image perception and skin-lightening practices on mental health of Filipino emerging adults: a mixed-methods approach protocol

Zypher Jude G Regencia, Jean-Philippe Gouin, Mary Ann J Ladia, Jaime C Montoya, Emmanuel S Baja

ABSTRACT

Introduction The rampant distribution of idealised images on the internet may lead the general public to improve their body appearance in a way that is sometimes excessive, compulsive or detrimental to other aspects of their lives. There is a decreasing appreciation of body image among emerging adults and an increasing trend on skin-lightening practices linked with psychological distress. This protocol describes the mixed-method approach to assess the relationships among body image perception, skin-lightening practices and mental well-being of Filipino emerging adults and determine the factors that influence them.

Methods and analysis An explanatory sequential mixed-method approach will be used. A cross-sectional study design will involve an online self-administered questionnaire of 1258 participants, while a case study design will involve in-depth interviews with 25 participants. Data analysis will use generalised linear models and structural equation modelling with a Bayesian network for the quantitative data. Moreover, the qualitative data will use an inductive approach in thematic analysis. A contiguous narrative approach will integrate the quantitative and qualitative data.

Ethics and dissemination The University of the Philippines Manila Review Ethics Board has approved this protocol (UPMREB 2022-0407-01). The study results will be disseminated through peer-reviewed articles and conference presentations.

INTRODUCTION

Mental health concerns and body images

Emerging adulthood represents a developmental period that follows adolescence and precedes adulthood. Various changes regarding their body will be experienced in this developmental period. These changes put the emerging adults at risk of being dissatisfied with their body appearance. Factors including the timing of puberty, body mass index changes, sexual experiences and sexual maturation affect how emerging adults perceive themselves and their bodies. Among emerging adults, there is an increasing trend of observations on body dissatisfaction linked with depression and psychological distress. Three essential factors became the basis for the later development of eating dysfunction due to body dissatisfaction: peers, parents and media, according to the Tripartite Influence Model. It is one of the most influential models depicting the development of eating problems. The model includes two intervening factors that connect the influences to disturbed body image and eating problems: the internalisation of the societal standard of appearance and increased tendencies to compare appearances. Patterned from the Tripartite Influence Model, in a previous study, results showed Filipino males had more significant dysfunction in eating attitudes compared with...
behaviours are eminent in non-Western culture due to the fear of getting fat. However, contrary to these previous results, positive body image was also linked with better overall well-being and quality of life. Measurements such as body appreciation and body esteem are positively associated with mental well-being.

**Global skin-lightening practices**

Skin-lightening practices became a trend among emerging adults to modify one’s skin tone. Skin-lightening practices are an understudied field in public health; therefore, there is an accentuated need for more epidemiologic research, particularly in under-represented countries. The global phenomenon of using skin-lightening products (SLPs) is rooted in the perception that lighter skin tones may result in more opportunities in life. SLP use among and between some ethnic/racial groups in Asia and Africa increased due to this perception. A lighter skin tone is seen as a symbol of beauty, attractiveness and desirability in the African region. Skin lightening is driven by a variety of factors, including psychological, cultural, sociopolitical and historical factors. Many international cosmetic companies have used these driving factors to capitalise on this market. Companies manufacturing SLPs used different marketing strategies, such as internet marketing and social media public relations. The cultural phenomenon of skin lightening has become widespread in Asia, and it may affect the mental well-being of SLPs consumers. In addition, some people use SLPs to manage and treat conditions relating to dermatology, including hyperpigmentation, melasma, age-induced darkening and acne. Homemade formulations using household items combined with SLPs are now rampant among consumers. However, the unregulated and unsupervised mixing of SLPs with household items may bring dangerous effects, such as ochronosis (blue-black hyperpigmentation in the skin).

**Skin-lightening practices and mental health concerns**

Studies examining the association between using SLPs and mental health problems are a relatively new field of study. However, it has been recently observed that SLPs use is significantly associated with body image disturbances and previous exposure to trauma. Research focused on skin-lightening practices also identified psychological correlates among Asian and African populations. There are related psychological problems that have been highlighted and are categorised as (1) self-esteem-related factors, (2) body image-related factors and (3) other potential psychological factors, such as the history of trauma and depressive symptoms. In the Philippines, the Filipino’s psychological state due to American colonialism contributes to the success of the rampant SLP use. In a more recent period, SLP use may also be attributed to the tendency to conform to popular culture. A recent study among young Filipino men pointed out that their body modification practices, particularly the use of SLPs, are mediated by the influence of peers, employers and global pop culture.

**Exposure to media and its influence**

Global pop culture consisting of the media and social media and peer pressures may influence how emerging adults see themselves. The emerging adult’s perception of their appearance can become distorted, leading them to engage in risky behaviours when they feel they do not measure up to the impossible goal set. The media’s effect on body image perception can cause body image issues, leading to greater risk for poor mental health conditions, eating disorders, drug and alcohol use, cutting and sexual risk behaviours. Media also plays an essential role in encouraging consumers to buy and use SLPs. In addition, the media portrays the lightness of the skin tone as an epitome and a standard for beauty in some cultures. Body image, beauty and fair skin tone are the main concepts of information dissemination and product advertisements portrayed in television, magazines, newspapers and on social media platforms, including Facebook, Twitter, Instagram and TikTok. The Philippines has recently passed the first law concerning the mental health of Filipinos, the Mental Health Act (Republic Act no. 11036). The Act seeks to establish access to comprehensive and integrated mental health services while protecting the rights of people with mental disorders and their family members. However, mental health programmes in the Philippines remain poorly funded by the government. It is estimated that only 3–5% of the total health budget is spent on mental health, while 70% is spent on hospital care. The Philippine Statistics Authority reported that mental illness in the Philippines is the third most prevalent form of morbidity. In addition, 6 million Filipinos are estimated to live with depression and/or anxiety, making the Philippines the country with the third-highest rate of mental health problems in the Western Pacific Region. The scarcity of epidemiologic evidence on mental health disorders in the Philippines is evident. These estimations do not represent the numbers of Filipinos living with mental health problems as state-funded country-wide mental health screening activities and programmes are not in place.
practices among Filipino emerging adults and its overall effect on the psychological distress of emerging adults remains understudied. Therefore, inclusive and extensive research examining various factors as patterned from the Tripartite Influence Model\(^a\) concerning this burgeoning field is crucial in these social-media-induced trying times when mental health is greatly affected.

**Study aims**

**General aim**
This study aims to assess the effect of body image perception on the mental health of Filipino emerging adults as mediated by skin-lightening practices and determine the factors that influence them.

**Specific aims**
1. To describe the Filipino emerging adults’ sociodemographic characteristics, stratified by their levels of depression, anxiety and stress.
2. To describe the body image perception of Filipino emerging adults, stratified by their depression, anxiety and stress.
3. To describe the skin-lightening practices of Filipino emerging adults, including their knowledge, perception and use of SLPs, stratified by their depression, anxiety and stress.
4. To estimate the effect of body image perception, skin-lightening practices and levels of media exposure on levels of depression, anxiety and stress among Filipino emerging adults.
5. To investigate the relationships among body image perception, skin-lightening practices and the levels of depression, anxiety and stress of Filipino emerging adults by testing a structural model.
6. To qualitatively identify the factors that contribute to or protect Filipino emerging adults from depression, anxiety, stress, body image concerns and skin-lightening practices.
7. To contextualise and expound the quantitative survey data results about the effect of body image perception and skin-lightening practices on levels of depression, anxiety and stress of Filipino emerging adults using the qualitative findings.

**METHODS AND ANALYSIS**

**Study design**
This study will use a mixed-method approach, specifically the explanatory sequential design, to address the study’s objectives due to complex interactions among body image perception, skin-lightening practices and mental well-being and gain a comprehensive and in-depth overview of this topic.\(^b\) We expect that qualitative and quantitative findings using the findings from the qualitative part of the study will also allow us to better understand and interpret the quantitative part of the study.

**Population and sampling technique**

**Study population**
This study will focus on Filipino emerging adults as the sample population. The inclusion and exclusion criteria are as follows:

A. **Inclusion criteria**
   1. 18–29 years old.
   2. Filipino residing anywhere in the Philippines.
   3. Male or female (sex-assigned-at birth) and all genders.
   5. Have internet access.

B. **Exclusion criteria**
   1. Refused to provide a signed informed consent form.
   2. Clinically diagnosed with depression or anxiety.

**Sample size calculation, sampling technique and recruitment plan**
For the online questionnaire, using the Error Function, Lower-Bound Sample Size and the Normal distribution Cumulative Distribution Function formulas for sample size calculation of structural equation models with a priori variables previously described,\(^54\)\(^55\) a total minimum sample size of 1258 Filipino emerging adults will be required. An anticipated effect size of 0.10, a desired statistical power level of 80%, three latent variables, 18 observed variables and an \(\alpha\) level of 0.05 were used to calculate the sample size. In addition, non-probability convenience sampling will be employed for this nationwide survey among the target study population. The study will occur from October 2022 to April 2023. The participants will be recruited using different online platforms to answer the online questionnaire voluntarily. These platforms will include the Top four social media: Facebook, Twitter, Instagram and Tiktok. In addition, there will be indicators in the questionnaire to screen for valid data, such as a time recording of the response rate and an attention checker between sections of the questionnaire.

In qualitative studies, the sample size is based on the number of participants needed to achieve concept saturation, the point in the data collection when little or no relevant information emerges, and collecting more data will not add new understandings to identified concepts.\(^56\)\(^57\) Studies showed that as few as 12 participants could be sufficient to explore shared experiences within a group,\(^58\) with 25 informants achieving 99% saturation of concepts.\(^59\) This study will use at least 25 informants as theoretical samples to investigate body image perception and skin-lightening practices. The initial 15 informants will include those that have severe/extreme levels of depression (five informants), anxiety (five informants) and stress (five informants) as measured during the quantitative survey. The remaining 10 informants will involving an online questionnaire among the intended study population; and (2) a Qualitative Part: a case study involving in-depth interviews of selected participants from the quantitative part of the study.
include those with no body image concerns (five informants) and those practicing skin lightening (five informants). Random sampling will be employed to select participants for the in-depth interview using the previously described criteria. In addition, to minimise selection bias, randomisation will be used for those chosen based on their outcome scores in the questionnaire (eg, extremely depressed, extremely anxious and extremely stressed informants), no body image concerns and practicing skin-lightening regimens. In addition, recruitment will be done by selecting the respondents who answered the online questionnaire. If the selected in-depth interviewees are uncontactable via the cellphone number or email address the informants provided, fail or decline to join; they will be replaced randomly by information-rich cases. Moreover, power dynamics will not be used to recruit respondents. The research objectives, methods, risks, benefits, voluntary participation, withdrawal and respondents’ rights will be discussed with the participants in the consent form before conducting the in-depth interview.

Data collection procedure
Quantitative part: cross-sectional survey
The study will involve creating and distributing a self-administered online questionnaire. The questionnaire will comprise sections of demographic data (age, sex, sexual orientation), socioeconomic status (average monthly household income, occupation, highest educational attainment, urban/rural residence), the levels of media exposure (television, movie, social media and internet), relationship status (single, in a relationship), exposure assessment (body image perception and skin-lightening practices) and outcome measurements (levels of depression, anxiety and stress). The online questionnaire will be distributed in English using the Qualtrics XM platform. All questions in the survey are forced choices. Informed consent detailing the purpose, risks, benefits, methods and other ethical considerations will be presented before the participants can answer the online questionnaire. Before online release, the questionnaire shall undergo pilot pre-testing among 20 Filipino emerging adults not involved with the study. It aims to measure total test-taking time, respondent satisfaction and understandability of questions. The survey form shall be edited according to the pilot test participants’ responses.

Exposures assessment
Body image perception will be the primary exposure, and skin-lightening practice is the mediator of this study. The concept of body image perception and skin-lightening practice will be considered latent variables in the hypothesised structural model. Three observed indicators will be used to build a measurement model around body image perception: Body Appreciation Scale (BAS-2),66 Body Esteem Scale (BES)67 and Positive Rational Acceptance Scale (PRAS).68 The BAS and BES measure how a person accepts each body feature, while PRAS assesses how a person responds to threats to these body features. Together, these three scales measure one’s positive body image perception. In addition, three observed indicators will also be used for the skin-lightening practice latent variable: Knowledge (K), Perception (P) and Use (U).

Research has already advanced the understanding of measuring body image perception, which gives a wide range of body image scales such as the BAS. BAS is a well-validated measure of positive body image. It represents intentional choices to accept body image regardless of its imperfections or size, respect the body by taking care of needs through engagement in health-seeking behaviours and safeguard the body by enduring the influence of narrow beauty standards promoted in the media.69 For each item, the following response scale will be used: 1=Never, 2=Seldom, 3=Sometimes, 4=Often and 5=Always.69 Previous research found a unidimensional factor structure, strong internal consistency (Cronbach’s α=0.97), construct validity and test–retest reliability (r=0.90) in community and college samples of men and women. In this study, the BAS-2 will be used, which was improved by rewording certain BAS items to remove sex-specific versions and body dissatisfaction-based language. Additional items based on positive body image research were also developed, making it a more psychometrically sound positive body image measure applicable for research.69 Additionally, the internal consistency of the BAS-2 was excellent (Cronbach’s α=0.954; McDonald’s ω=0.956).69

BES for adolescents and adults is widely used to assess cognitive and affective features of body image perception.66 BES was designed for both men and women young adults and validated among college students.65 The scale represents distinct dimensions for men and women.66 This study will employ 19 out of the original 35 BES items. The 19 items were selected to include all items about the ‘physical condition’ and ‘weight concern/upper body strength’ factors. The ‘sexual attractiveness’ items were excluded, which had the majority of ‘physical attractiveness’ items for men.67

Lastly, another well-accepted body image perception scale measures positive rational acceptance coping. PRAS has been conceptualised and designed as an adaptive affect regulation mechanism when the body is exposed to body image challenges.62 Generally, PRAS involves positive self-talk, such as reminding oneself of the transience of experiencing body image concerns in the aftermath of a threat, and is positively associated, although weakly, with more general adaptive emotional regulation strategies.68 Participants will be asked to complete an 11-item PRAS of the body image coping strategies inventory (BICSI).62 Scores on the BICSI have been shown to have adequate factorial and construct validity and internal consistency. Cronbach’s α for PRAS scores was 0.85 (95% CI: 0.83 to 0.87).62

The questionnaire on skin-lightening practices will be adapted from a previous study conducted in Southeast Asia, including Indonesia, Malaysia, Myanmar, Thailand
and Vietnam. Knowledge of the use of SLPs will be assessed with two questions, (a) the awareness that SLPs can harm the skin; and (b) knowing the active ingredients in SLPs. Perceptions about a lighter skin tone and the use of SLPs will be assessed with eight items. Response options will be 1=strongly agree, 2=agree, 3=disagree, to 4=strongly disagree (Cronbach’s $\alpha=0.78$). Furthermore, SLP use will be assessed with two questions: ‘Have you ever used SLPs?’ and ‘How often have you used SLPs in the past year?’ in which response options will be yes or no and will range from 0=never to 4=at least once per 3 months, respectively.

**Outcome measurements**

The validated Depression Anxiety Stress Scales-21 (DASS-21) will be used to assess the psychological distress of the respondents. DASS-21 was developed to measure the emotional states of depression, anxiety and stress. DASS-21 has been previously used in American, European and Asian populations. DASS-21 contains three subscales with seven items each to measure levels of depression, anxiety and stress. DASS-21 scores will be calculated based on previous studies. The total score will be summed up in which higher scores indicate more negative experiences in the past week. For descriptive analysis, the total depression subscale will be divided into normal (0–9), mild depression (10–12), moderate depression (13–20), severe depression (21–27) and extremely severe depression symptoms (28–42). In addition, the total anxiety subscale score will be divided into normal (0–6), mild anxiety (7–9), moderate anxiety (10–14), severe anxiety (15–19) and extremely severe anxiety symptoms (20–42). Moreover, the total stress subscale score will be divided into normal (0–10), mild stress (11–18), moderate stress (19–26), severe stress (27–34) and extremely severe stress (35–42).

**Sociodemographic variables and levels of media exposure**

Based on previous literatures, the sociodemographic variables will be ascertained and selected a priori. These variables include age, sex at birth, sexual orientation, household income, working status, highest educational attainment, relationship status and type of residence. Additionally, the level of media exposure will also be ascertained using a questionnaire adapted from a study done in the Philippines with a few modifications. The instrument will include questions on the influence of movies, television, the internet and social media platforms on the participants’ body image perception and skin-lightening practices. Some examples of the questions included in this section are: ‘I watch more than nine movies in a month’, ‘I immediately try any new product that I saw in a commercial’, ‘I feel handsome or beautiful when my solo picture gets a lot of likes or comments’ and ‘I compare my appearance with the photos of my Facebook friends, Instagram/Twitter mutuals, TikTok videos and other photo posts on social media’. Questions will be answered as never, sometimes, often and always.

**Qualitative part: case study**

Concept notes will be developed focusing on the extraneous factors affecting the participants’ body image perception, skin-lightening practices and psychological distress. Some salient topics will include current stressors (eg, personal, familial, social), emotional reactions to these stressors and facilitators that enable the participants to achieve their current motivations to modify their bodies and/or lighten their skin.

The researchers will facilitate the in-depth face-to-face interview or via various online video conferencing software such as Google Meet, Skype or Zoom. All the in-depth interviews will be recorded and transcribed for analysis. Online supplemental file 1 shows the in-depth interview guide and discussion questions.

**Data processing and analysis**

**Quantitative part: cross-sectional survey**

Descriptive statistics will be calculated and presented in frequencies and percentages for categorical variables and mean, SD and range for continuous variables to answer Specific Aim Nos. 1–3. Differences in the sociodemographic characteristics between participants will be assessed using t-tests (for continuous variables) and $\chi^2$ or Fisher’s exact tests (for categorical variables). In addition, effect estimates will be calculated to assess the relations among body image perception, skin-lightening practices, mental health status, levels of media exposure and sociodemographic variables to answer Specific Aim No. 4. Moreover, associations between exposures (body image perception and/or skin-lightening practices) and mental health status will be estimated using generalised linear models. Depending on how common the mental health outcomes are, generalised linear models with either a Poisson distribution and log link function with a robust variance estimator or a binomial distribution and logit link function will be used to estimate either the crude and adjusted prevalence ratios (PRs) or crude and adjusted odds ratios (ORs) with 95% CI, respectively. All regression analyses will be done in R software, and p values $\leq 0.05$ will be considered statistically significant.

For Specific Aim No. 5, proposed structural and measurement models will be used based on the literature review (figure 1). The specified model was built from reviewing previous literature on body image perception and skin-lightening practices regarding their expected relationships among the key constructs and health outcomes. Structural equation modelling (SEM) will be used to estimate and test the direct and indirect effects of the latent exposure variables (body image perception and skin-lightening practices) on the latent mental health status variable. This study will focus on the structural and measurement models.

The responses in the structural model in figure 1 are specified as ordered categorical (ordinal) variables. The
default estimator for responses such as these is a robust weighted least squares estimator. This estimation specifies a series of probit regression equations for each factor indicator on the related factor. The distribution of all observed variables will be specified in the estimation procedure. All specified models will be estimated using traditional Maximum Likelihood Estimation (MLE) and Bayesian estimation. In the MLE specification, variances of the factors will be assumed to be standard normally distributed, that is, with a variance of 1 and a mean of 0. The MLE method estimates parameters and their SE and fit indices using a normal distribution for all parameter models based on an elements matrix derived from the asymptotic variances of the thresholds and latent correlation estimates. Results will be presented as standardised loadings, interpreted as probit regression coefficients. All analyses will be done in R software.

Qualitative part: case study
This part of the data analysis will answer Specific Aim No. 6. One researcher will transcribe the interview, while two other researchers will validate the transcription by checking the transcript vis-à-vis the interview recordings. After transcribing the interviews, the data transcripts will be analysed using NVivo 1.6.2 software by three research team members independently using the inductive logic approach in thematic analysis: familiarising with the data, generating initial codes, searching for themes, reviewing the themes, defining and naming the themes and producing the report.

Data familiarisation will consist of reading and re-reading the data while noting initial ideas. Additionally, coding interesting features of the data will follow systematically across the entire dataset while collating data relevant to each code. Moreover, the open coding of the data will be performed to describe the data into concepts and themes, which will be further categorised to identify distinct concepts and themes.

Data analysis of the interviews will be carried out according to the steps described by previous literature using a coding technique wherein the early data analysis is a critical step in the overall interpretation of the case studies. The researchers will begin by coding each line of each participant’s transcript. Similar codes will then be grouped to form subcategories, and within these subcategories, categories will be identified. The primary researcher will then group the categories to develop a theory related to key informants’ experiences of body image perception, skin-lightening practices and mental health status. The data collection process will continue until each category is saturated and no new data emerges. There will be comparisons and contrasts of the analyses conducted to develop a thematic map as discussed by the three researchers. The final thematic map of the analysis will be generated after checking if the identified themes work in relation to the extracts and the entire dataset. In

Figure 1 Structural model for the exposure, mediator and outcome variables. A, anxiety; BA, body appreciation; BE, body esteem; D, depression; EA, education attainment; HI, household income; K, knowledge; P, perception; PRA, positive rational acceptance; R, type of residence; RS, relationship status; S, stress; SO, sexual orientation; U, use; WS, working status.
addition, the selection of clear, persuasive extract examples that connect the analysis to the research question and literature will be reviewed before producing a scholarly report on the investigation. Additionally, the themes and sub-themes generated will be assessed and discussed in relevance to the study’s objectives. Furthermore, gathering and analysing the data will continue until saturation is reached. Finally, pseudonyms will be used to present quotes from the qualitative data.

Data integration from quantitative and qualitative findings
Specific Aim No. 7 will be answered using a contiguous narrative approach. It will be implemented to report and integrate the mixed-method results, reporting results of the quantitative strand followed by results of the qualitative strand in different subsections. Data triangulation will integrate the two separate data sources by examining the various aspects of the research and comparing them for convergence. Qualitative and quantitative data integration at the interpretation and reporting level will occur through joint displays.112 113 When integrating through joint displays, the researchers will bring the data together visually to draw out new insights beyond the information gained from the different quantitative and qualitative results. This integration can occur through organising related data in a figure, table, matrix or graph.114–116 Two researchers will be involved in the qualitative and quantitative data triangulation. Should there be disagreements, again the primary researcher together with the multidisciplinary research team will resolve the issue. Figure 2 shows the study’s implementation matrix of the explanatory sequential design.

Data management plan
The primary researcher will be responsible for overall quality assurance undertaking specific activities to ensure quality control. Quality will be assured through routine monitoring of data collection procedures and periodic cross-checks against the approved protocol. Transcribed interviews and the online questionnaire will be used to record data for each participant in the study. The primary researcher will ensure the data’s accuracy, completeness, legibility and timeliness. Data captured from the online questionnaire or in-depth interviews should be consistent, clarified and corrected.

Handling missing data
All responses in the questionnaire using the Qualtrics XM will be forced. In self-report measures, data can be missing at either the item or variable level. Item level missingness occurs when subjects omit one or more items within a multi-item instrument that measures an abstract concept or variable. Variable level missingness occurs when all items on a multi-item instrument are missing. The survey forms with missing data for any variables used in the analysis will be removed. Rough guidelines for this approach suggest that if less than 10% of study participants have missing data for one or more of the analysis variables, the study results should not be significantly affected.117 118 Multiple imputations will be used to analyse incomplete or missing data. If more than 40% of observations have missing values, then variables with the most missing values should be removed from the analyses.117 118

Participant and public involvement statement
The participants and the public were not involved in the design and implementation of the protocol.

Ethical considerations and disseminations
Ethical considerations
The study shall abide by the Principles of the Declaration of Helsinki (2013). It will be conducted along with the Guidelines of the International Conference on Harmonization-Good Clinical Practice (ICH-GCP), E6 (R2) and other ICH-GCP 6 (as amended); Philippine National Ethical Guidelines for Health and Health-Related Research (NEGHRR) of 2017. Furthermore, this study protocol was granted ethical clearance from the University of the Philippines Manila Research Ethics Board (UPMREB 2022-0407-01).

All digital data will be stored in a cloud drive accessible only to the researchers. In addition, subject confidentiality will be upheld by assigning control numbers and not requiring participants to divulge their name, address and other identifying factors unnecessary for analysis. After the study, the personal data gathered from the participants will be deleted from the system and will be wiped out from the cloud drive where the data is stored. Participants may access the study results on sending a considerable request to the primary researcher. The data provided in this informed consent form are all valid during the duration of the study, which is 6 months but will be stored for up to 3 years.

Dissemination
The results will be disseminated through conference presentations, peer-reviewed journals and stakeholder activities.

DISCUSSION
The need to demonstrate more evidence
The topic of mental health has received a remarkable increase in global attention. Over time, trends showed an increasing number of people suffering from mental health disorders.119–121 The worldwide rise in the incidence of mental health disorders prompted researchers to investigate more on this phenomenon. Growing evidence suggests that a positive body image is connected to improved social, psychological and emotional health, including physical health.122–125 Reports have also suggested an association between a pattern of better mental health status and using SLs.19 126 127

The explanation speculated behind the determinants of skin-lightening practices suggests that symptoms of good mental health are linked with deficits in self-esteem
or body image. Many people in some populations are now more likely than ever to lighten their skin to fit into society’s definition of beauty. People who use SLPs feel like they belong in a community where beauty standards must be accepted. In addition, using SLPs may also be viewed as a coping mechanism for some people. The biological and psychosocial phenomenon of skin lightening involves the observed interaction among three essential factors: motivation to engage in skin lightening, the different practices of skin lightening and its related effects and the prevention and treatment processes.

Little is known, however, about the interaction of various factors relating to body image concerns and skin-lightening practices and their effect on mental health status. In the Philippines, this emerging scientific field of research is not fully explored. For example, previous local studies only dealt with body image and mental health, or skin-lightening practices, but not the combination. Furthermore, these local studies on body image and mental health mainly tackled body dissatisfaction and depression, contrary to our study which will deal with positive body image. In addition, local studies on skin-lightening practices specifically discussed how colonialism affected how Filipinos think about skin colour.

Figure 2 Implementation matrix for the proposed explanatory sequential mixed-method study.
The link between body image perception, skin-lightening practices and the mental health status of Filipino emerging adults is not fully understood. This study will explore other factors contributing to the prevalence of mental health disorders brought about by the overall interaction, direct and indirect effects of body image perception and skin-lightening practices.

**Study significance**

This study focuses on the overall interplay of body image perception and skin-lightening practices and their effect on the mental health status of Filipino emerging adults. On an individual level, this study may increase the awareness of Filipino emerging adults as to the effect of body image perception and skin-lightening practices on their mental health status. Furthermore, this study may help them understand how the interplay of body image perception and skin-lightening practices and their effects on mental health status is affected by various factors culturally sensitive to Filipinos. On a societal level, explicit action is needed to build and promote positive body image perception to support reasonable mental health concerns. This study could be a first step toward providing evidence on effectively regulating body image concerns and practicing safe skin-lightening practices. In addition, the results of this study may give the Education Department at secondary and tertiary levels the foundation and basis to include and promote positive body image perception, safe skin-lightening practices and mental health status in their current curricula. Furthermore, the Education Department may include it through the inculcation of body and skin tone diversity in the early education learning stages of the students.

**Study limitations**

This study is only limited to Filipino emerging adults residing in the Philippines. In addition, it may also be limited to the study population with internet access since the questionnaire will be available online. Therefore, this study may not capture the intended study population who do not have access to the internet.

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**Collaborators**

Dr Margaret Gamalo (Executive Director - Biostatistics Global Product Development, i&i Statistics Global Biometrics & Data Management, Pfizer Innovative Health)

**Contributors**

All persons listed as authors have met the International Committee of Medical Journal Editors (ICMJE) authorship criteria. All authors have made significant contributions and revisions to the final manuscript and have provided complete consent for publication. Each author is responsible for the content and has read and approved the final manuscript. No author has any conflict of interest and/or disclosure to state for this manuscript. This includes financial, institutional, consultant and other relationships. ZJGR conceived the study with guidance from ESB. ZJGR conceptualised and designed the protocol. ESB, ZJGR contributed to the introduction, methods and analysis, strengths and limitations and discussion. All authors reviewed and approved the manuscript.

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**Competing interests**

None declared.

**Patient and public involvement**

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication**

Not applicable.

**Provenance and peer review**

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**Supplemental material**

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**ORCID iDs**

Zypher Jude G Regencia http://orcid.org/0000-0002-3383-6336
Jean-Philippe Guin http://orcid.org/0000-0002-5497-5140
Mary Ann J Ladia http://orcid.org/0000-0003-4757-8072
Jaime C Montoya http://orcid.org/0000-0002-0631-6298
Emmanuel S Baja http://orcid.org/0000-0002-3888-8880

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