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ABSTRACT

Introduction: The rampant distribution of idealized 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. Among emerging adults, there is an increasing trend of body image and/or skin lightening practices linked with psychological distress. This protocol describes the mixed-method approach to assess the relationships among body image, skin lightening, and mental well-being of emerging Filipino adults and determine the factors that influence them.

Methods and Analysis: A sequential explanatory mixed-method approach will be utilized using quantitative and qualitative data collection methods. A cross-sectional study design will involve an online self-administered questionnaire on 1,258 participants, while a case study design will involve in-depth interviews with 25 participants. Data analysis will use generalized linear models and structural equation modeling with a Bayesian network for the quantitative data, while qualitative data will utilize an inductive approach in thematic analysis. A contiguous narrative approach will be used to integrate the quantitative and qualitative data.

Conclusion: This protocol outlined the procedures for future researchers working on a similar mixed-method approach to evaluate the effect of body image and/or skin lightening practices on psychological distress. The results may provide information on the possible inclusion of mental health and body issues as topics in the secondary and tertiary education curricula to teach young minds the importance of caring for both physical and mental health.

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.

Keywords: body image, emerging adults, Filipinos, mental health, mixed methods, skin lightening
STRENGTHS AND LIMITATIONS

1. The mixed methods approach will allow the researchers to capture the complexity of human phenomena, such as the main interests of this research – body image and skin lightening practices.

2. The use of a mixed-method approach will allow for greater validity by seeking corroboration between the gathered quantitative and qualitative data.

3. The use of case study design may be used at various points of the research project, and the ability to explore deeper causes of particular phenomena will be achieved.

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

5. The use of a cross-sectional study design in the quantitative part will not examine the temporal relationships between body image, skin lightening practices, and mental health status.

INTRODUCTION

The period of adolescence emphasizes the fast development of physical, emotional, social, and psychological changes. Most adolescents acquire the knowledge and information influencing attitudes about healthy lifestyle. Peer groups have an essential role in molding the social norms of these adolescents, including their values and perception of body appearances. Across time and place, the centralized process among adolescents and emerging childhood to develop a coherent understanding of oneself is called “identity development.” Among adolescents, this phase is characterized by the beginning of puberty, advancement in cognitive abilities, expansion of social territory, and growth in socio-cultural influence to discover one’s
Identity confusion often goes along with puberty, when the body of adolescence undergoes a rapid change. Identity exploration follows this identity confusion that can lead to incorporating the personal identity into a coherent whole.

Media, social media, and peer pressures may influence how adolescents see themselves. Their mental perception of their appearance can become distorted, leading them to engage in risky behaviors when they feel they do not measure up to the impossible goal set. The media’s effect on body image can cause body image issues, leading to greater risk for poor mental health conditions, eating disorders, drug and alcohol use, cutting, and sexual risk behaviors. Researchers from communication and social psychology have commenced investigating the interplay between body image, social comparison, and social media. The perception of using social media to influence negative issues relating to the body, such as low body esteem, is not a new phenomenon. Several research reports documented the negative impacts of an idealized image on the female body. The same idealized body image portrayed in social media may have similar effects. A previous study presented that social media posts relating to their inspirations to be fit negatively affected body image rather than inspiring the participants to switch to healthier lifestyle choices. A United Kingdom National survey showed that 1 out of 20 men and 1 out of 10 women were reported to appear dissatisfied with their body image. However, the idea of being thin may be slowly changing for pressures around weight and shape. A review of some research spanning 30 years reported that the motivation to be thin among girls and women gradually decreases over time. However, the basis for being muscular among boys and men and girls and women has been consistent across the three-decade research.

Among emerging adults, there is an increasing trend of observations on body dissatisfaction linked with depression symptoms, psychological distress, and eating disorders. On the other hand, positive body image was also linked with better overall
well-being and quality of life. Measurements such as body appreciation and body esteem are related to a positive association with mental well-being. Factors associated with body image among adults differ from one population to another. These factors depend on the degree of what constitutes the “ideal” body type and the likelihood of how individuals compare themselves with others based on appearance.

On the other hand, skin lightening practices are an understudied field in public health, and therefore, there is an accentuated need for more epidemiologic research, particularly in underrepresented countries. The global phenomenon of using skin lightening products (SLPs) is a shepherd on the perception that lighter skin tones may result in more opportunities in life. This perception led to the growing consumption of SLPs, in between and within ethnic/racial groups. A lighter skin tone is seen as a symbol of beauty, attractiveness, and desirability. Among men and women worldwide, the motivation for skin lightening is multifactorial with the interplay of historical, cultural, sociopolitical, and psychological influences. Many international cosmetic companies have used these motivations to capitalize on this market. Companies manufacturing SLPs utilized different marketing strategies, such as the internet, to capture racial and colorized norms or values and the class and gender differences within the White and non-White markets.

Studies examining the association between the use of SLPs and mental health problems are relatively a new field of study. However, it has been recently observed that SLP use is significantly associated with body image disturbances and previous exposure to trauma. Research focused on skin-lightening practices also identified psychological correlates. There are related psychological problems that have been highlighted and are categorized 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.
This study was conceptualized owing to past literature and growing body of evidence concerning the effect of body image and skin lightening practices on the mental well-being of both men and women. The interplay of body image and skin lightening practices is anchored on the history of racism and modern world globalization in the contemporary context where social media (mediascapes) dictate a hegemonized body image and skin color, thus, affecting a person’s mental health status. However, the interaction between body image and skin lightening practices among Filipino emerging adults and its overall effect on the psychological distress of emerging adults remained understudied. Therefore, inclusive and extensive research examining various factors concerning this unfolding field of study 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 on the mental health of emerging Filipino adults as mediated by skin-lightening practices and determine the factors that influence them.

**Specific Aims:**

1. To describe the emerging Filipino adults’ characteristics, stratified by their levels of psychological distress;

2. To describe the body image status of the emerging Filipino adults’, including levels of body appreciation, levels of body esteem, and their positive rational acceptance, stratified by their mental well-being status;

3. To describe the skin lightening practices of the emerging Filipino adults’, including their knowledge, perception, and use of skin lightening products, stratified by their mental health status;

4. To estimate the effect of body image status, skin-lightening practices, and levels of media exposure on mental health among emerging Filipino adults;
5. To investigate the structural relationships among body image, the status of skin lightening practices, and the mental health of emerging Filipino adults by testing a structural model;

6. To determine the stressors and facilitators among emerging Filipino adults that modified their mental well-being status as influenced by their body image status and skin lightening practices; and

7. To explain the quantitative survey data results about the effect of body image and skin lightening practices on the mental health of emerging Filipino adults using the qualitative findings.

METHODS AND ANALYSIS

Study Design

This study will utilize a mixed-method approach, specifically the explanatory sequential design, to address the study's objectives due to complex interactions among body image, skin lightening, and mental well-being and gain a comprehensive and in-depth overview of this topic, narratively and numerically. This mixed-method approach includes (1) Quantitative Part: Cross-Sectional Study involving an online survey among the intended study population; and (2) Qualitative Part: Case Study involving in-depth interviews of purposively/non-probability selected participants.

Study Setting

The study shall occur from October to December 2022 under the Alert Level 1 pandemic. This research is the Philippines' first study that will determine the overall effect of the interplay between body image and skin lightening on emerging Filipino adults' mental health.
Population and Sampling Technique

Study Population

This study will focus on emerging Filipino adults as the sample population. In 2019, it was estimated that about 18.8 million Filipinos are 18-29 years old, which comprises the youth sector of the country. The inclusion and exclusion criteria are as follows:

A. Inclusion Criteria

1. 18-29 years old; and
2. Filipino residing anywhere in the Philippines; and
3. Male or female; and
4. Can understand English and/or Filipino; and
5. Have internet access

B. Exclusion Criteria

1. Refused to provide a signed informed consent form
2. Self-reported clinically diagnosed with mental health disorders (e.g., depression, anxiety, etc.)

Sample Size Calculation and Sampling Technique

For the online survey, 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, a total sample size of 1,258 emerging Filipino 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 α-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. Moreover, online tools will be utilized to disseminate the online survey questionnaire.
In qualitative studies, the sample size is based on the number of participants needed to achieve concept saturation. This study will utilize at least 25 informants as theoretical samples to investigate body image and skin-lightening practices. It will continue adding more informants until saturation is achieved. The initial 15 informants will include those that have extreme levels of depression (5 informants), anxiety (5 informants), and stress (5 informants) as measured during the quantitative survey. The remaining ten informants will include those with low body image status (5 informants) and those practicing skin lightening (5 informants).

Purposive sampling will be employed to select participants for the in-depth interview using the previously described criteria. To minimize selection bias, randomization will be utilized for those who were purposively chosen based on their outcome scores in the survey (e.g., extremely depressed, extremely anxious, and extremely stressed informants), low body image status, and practicing skin lightening. In addition, recruitment will be done by selecting the respondents who answered the online survey. If the in-depth interviewees are uncontactable, fail or decline to join, they will be replaced by information-rich cases.

Data Collection Procedure

Quantitative Part: Cross-Sectional Survey

The study will involve creating and distributing a Self-Administered Questionnaire (SAQ). The SAQ will comprise sections of demographic data (age, sex, sexual orientation), socio-economic status (average monthly household income, occupation, highest educational attainment, residence), the levels of media exposure (television, movie, social media, and internet), relationship status (single, in a relationship), exposure assessment (body image and skin lightening), and outcome measurements (depression, anxiety, and stress). The online survey will be distributed in English with Filipino translation using the Qualtrics XM™ platform. Informed consent detailing the purpose, risks, benefits, methods, and other ethical considerations will be included before the participants can answer the survey. Before the
survey's release, the SAQ shall undergo pilot pre-testing among twenty (20) emerging Filipino 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 will be the primary exposure, and skin lightening is the mediator of this study. The concept of body image and skin lightening will be considered latent variables in the hypothesized structural model. Three observed indicators will be used to build a measurement model around body image: Body Appreciation Scale (BAS-2), Body Esteem Scale (BES), and Positive Rational Acceptance Scale (PRAS). In addition, three observed indicators will also be used for the skin lightening latent variable: Knowledge (K), Perception (P), and Use (U).

BAS-2 is easy to administer and score. For each of the item, the following response scale will be used: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Always. Previous research found a unidimensional factor structure, strong internal consistency (Cronbach’s \( \alpha = 0.97 \)), construct validity, and test-retest reliability (\( r = 0.90 \)) in community and college samples of men and women. Additionally, the internal consistency of the BAS-2 was excellent (Cronbach’s \( \alpha = 0.954 \), McDonald’s \( \omega = 0.956 \)). On the other hand, BES was designed for young adults, both men and women, and validated among college students. The scale represents multiple dimensions that differ for men and women. 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. PRAS, in particular, has been conceptualized and designed as an adaptive affect regulation mechanism when the body is exposed to body image challenges. Generally, PRAS involves positive self-talk, such as reminding oneself of the transience of experiencing negative
body image-related feelings in the aftermath of a threat, and is positively associated, although weakly, with more general adaptive emotional regulation strategies.\textsuperscript{52} With these reports, PRA may serve as a bridge in the link between nature exposure and positive body image\textsuperscript{53}. Participants will be asked to complete an 11-item PRA subscale of the body image coping strategies inventory (BICSI).\textsuperscript{51} Scores on the BICSI have been shown to have adequate factorial and construct validity and internal consistency. Cronbach's $\alpha$ for PRA scores was 0.85 (95\% CI = 0.83–0.87).\textsuperscript{51}

The questionnaire on skin lightening will be adapted from a previous study conducted in Southeast Asia, including Indonesia, Malaysia, Myanmar, Thailand, and Vietnam.\textsuperscript{54} Knowledge of SLP will be assessed with two questions, (a) the awareness that SLP can harm the skin; and (b) knowing the active ingredients in SLP.\textsuperscript{55} Perceptions about a lighter skin tone and SLP will be assessed with eight items. Response options will range from 1 = strongly agree 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?” Response options will be yes or no and will range from 1 = never to 4 = more than ten times, respectively.\textsuperscript{56}

**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 constructs of depression and anxiety and to address the failure of earlier emotional measures in discriminating between anxiety and depression.\textsuperscript{57} DASS-21 has been previously used in American,\textsuperscript{58} European,\textsuperscript{59} and Asian\textsuperscript{60-63} populations. Each of the three DASS-21 scales contains seven items, divided into subscales with similar content. DASS-21 scores will be calculated based on previous studies.\textsuperscript{64-66} 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, anxiety, and stress subscales will be divided into normal, mild, moderate, severe, and extremely severe, based on published cut-off scores.

Socio-Demographic Variables and Levels of Media Exposure

The socio-demographic variables will also be ascertained and were selected a priori based on previous literature. 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 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 and skin lightening.

Qualitative Part: Case Study

Concept notes will be developed focusing on the extraneous factors affecting the participants’ body image, skin-lightening practices, and mental health status. Some salient topics will include current stressors (e.g., 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 primary researcher 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. 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, standard deviation, and range for continuous variables to
answer Specific Aim Nos. 1-3. Differences in the characteristics between participants will be assessed using t-tests (for continuous variables) or Chi-square or Fisher’s exact tests (for categorical variables). In addition, effect estimates will be calculated to assess the relations among the body image, skin lightening practices, mental health status, levels of media exposure, and socio-demographic variables to answer Specific Aim No. 4. Moreover, associations between exposures (body image and/or skin lightening) and mental health status will be estimated using generalized linear models, a standard method for analyzing data in cross-sectional studies. Depending on how rare or common the mental health status outcomes are, generalized 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 odds ratios (ORs) with 95% confidence intervals (CIs), respectively. All regression analyses will be done in R software, and p-values ≤ 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 grounded in a sound theoretical framework of body image and skin lightening regarding their expected relationship among key constructs and mental health status outcomes. Structural equation modeling (SEM) will be used to estimate and test the direct and indirect effects of the latent exposure variables (body image and skin lightening) 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. For responses such as these, the default estimator in Mplus software 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, i.e., with a variance of 1 and a mean of zero. The MLE method estimates parameters and their standard error 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.\textsuperscript{90} \textsuperscript{91} Results will be presented as standardized loadings, interpreted as probit regression coefficients.\textsuperscript{89}

\textbf{Qualitative Part: Case Study}

This part will answer Specific Aim No. 6. After transcribing the interviews, the data transcripts will be analyzed using NVivo 1.6.2 software\textsuperscript{92} utilizing the inductive logic approach in thematic analysis: familiarizing with the data, generating initial codes, searching for themes, reviewing the themes, defining and naming the themes, and producing the report.\textsuperscript{93} Data familiarization 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 categorized to identify distinct concepts and themes.\textsuperscript{94}

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.\textsuperscript{95} The primary researcher will begin by coding each line of each patient participant's transcript. Similar codes will then be grouped to form subcategories, and within these subcategories, categories will be identified. The primary researcher then will group the categories to develop a theory related to key informants’ experiences of body image, 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. 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 addition, the selection of clear, persuasive extract examples that will connect the analysis to the research question and literature will be reviewed before producing a scholarly report of the investigation. Additionally, the themes and sub-themes generated will be assessed and discussed in relevance to the study's objectives. Furthermore, gathering and analyzing 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. Integration of qualitative and quantitative data at the interpretation and reporting level will occur through joint displays. When integrating through joint displays, the primary researcher 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 organizing related data in a figure, table, matrix, or graph. Figure 2 shows this 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 survey 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 survey or in-depth interviews should be consistent, clarified, and corrected.

Handling Missing Data

All responses in the SAQ using the Qualtrics XM™ will be forced. However, there are instances where missing data will be observed. 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. Moreover, multiple imputations will be used in this case to analyze 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.\textsuperscript{101, 102}

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 (NEGHHRR) of 2017.
Furthermore, this study protocol was granted ethical clearance from the University of the Philippines Manila Research Ethics Board (UPMREB 2022-0407-01).

The participants will be recruited using different online platforms to answer the online SAQ voluntarily. These platforms will include the Top 3 social media: Facebook, Twitter, and Instagram. There will be indicators in the SAQ to screen for valid data, such as time recording of the response rate and an attention checker between sections of the SAQ. The recruitment of participants for the in-depth interview will be chosen through random sampling utilizing a list of those who answered the online SAQ; this will minimize the risk of sampling bias. In addition, none of the participants will have prior contact or association with the primary researcher. 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.

All digital data will be stored in a cloud drive accessible only to the primary researcher. 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 upon 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 six (6) months but will be stored for up to three (3) years.

**Dissemination**

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

The Philippines has recently passed the first law concerning the mental health of Filipinos, the Mental Health Act (Republic Act No. 11036). This law 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 remains 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 scarcity of epidemiologic evidence on mental health disorders in the Philippines is also evident, but some essential pieces of information are available. A report estimated that 14% of the 1.4 million Filipinos with disabilities were recognized to have mental health disorders. The Philippine Statistics Authority reported that mental illness in the Philippines is the third most prevalent form of morbidity. However, only about 88 clinical cases of mental health problems are reported for every 100,000 Filipino population. This finding underestimates the number of mental health cases in the Philippines. Reports also showed that 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 topic of mental health has received a remarkable increase in global attention. Over time, trends showed an increasing number of people suffering from depressive disorders. The worldwide rise in the incidence of mental health disorders prompted researchers to investigate more on this phenomenon. A growing body of literature outlines the undesirable mental health consequences of body issues, including body image and skin lightening practices. Previous research outlined the issues of body appearances leading to unhealthy weight control behaviors that are sometimes excessive or detrimental to one’s mental health. In addition, reports have suggested an association between a pattern of poor mental health status and the use of SLP.
Similarly, the explanation speculated behind the psychologic determinants of skin
lightening practices suggests that symptoms of poor mental health are linked with deficits in
self-esteem or body image. The psychological effect for many people to lighten one’s skin to
fit within the larger society’s definition of beauty is now more rampant than ever. Moreover,
using SLP gives people a sense of belongingness in the community where acceptance of beauty
standards is inevitable. Hence, using SLP may also be viewed as a destressing and coping
mechanism. However, little is known about the interaction of these factors relating to body
appearance and beauty standards problems. 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 and mental health. The link
between body image, skin-lightening practices, and the mental health status of emerging
Filipino adults is not fully understood. Moreover, 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, and skin lightening practices.

This study will focus on the overall interplay of body image and skin-lightening
practices and their effect on the mental health status of emerging Filipino adults. On an
individual level, this study may increase the awareness of emerging Filipino adults as to the
effect of body image and skin-lightening practices on their mental health status. Furthermore,
this may help them understand how this phenomenon is affected by various factors culturally
sensitive to the Filipinos. On a societal level, explicit action is needed to build and promote
positive body image and safe skin-lightening practices to support good mental health and well-
being concerning our bodies. This study may be a stepping stone to providing evidence on how
effectively regulating body image and safe skin lightening practices are portrayed in the
Philippines. In addition, the results of this study may give the Education Department at both
secondary and tertiary levels the foundation to include and promote positive body image, safe
skin lightening, and mental health status in the current curriculum. Furthermore, the Department can include it through the inculcation of body and skin tone diversity in the early education learning stages of the students.

**Figure Legends**

Figure 1. Structural model for the exposure, mediator, and outcome variables

Figure 2. Implementation Matrix for the proposed explanatory sequential mixed-method study

**REFERENCES**


37. Rusmadi SZ, Syed Ismail SN, Praveena SM. Preliminary study on the skin lightening practice and health symptoms among female students in Malaysia. *Journal of environmental and public health* 2015;2015


71. Ramesh J. Study on Society s influence on Women s portrayal in the Indian Media with special reference to Advertising and Movies. 2019


105. Lim LTS, Regencia ZJG, Dela Cruz JRC, et al. Assessing the effect of the COVID-19 pandemic, shift to online learning, and social media use on the mental health of college


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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. ZGR conceived the study with the guidance from ESB. ZGR conceptualized and designed the protocol. ESB, MJL, JPG, MG, and JCM 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.

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**Provenance and peer review:** Not commissioned; externally peer reviewed.
**Figure 1.** Structural model for the exposure, mediator, and outcome variables.

Figure 2. Implementation matrix for the proposed explanatory sequential mixed-method study.
Appendix 3  
In-depth Interview  
Guides and Discussion Questions

Objectives and Participants

The objective of this study is to gather data and form insights relevant to body image and skin lightening practices of emerging Filipino adults. As a first step towards achieving this, in-depth interviews will be conducted to gain knowledge and discover relevant themes and topics.

This study is purposely targeted towards both male or female aged 18-29 years in the Philippines. Specifically, this study aims to determine stressors and facilitators among emerging Filipino adults that modified their mental well-being status as influenced by their body image status and skin lightening practices. Salient topics will include current stressors (e.g., personal, social, familial), emotional reactions to these stressors, and facilitators that enable the participants to achieve their current motivations to modify their body or lighten their skin.

Each interview is expected to run for approximately 30 to 45 minutes.

Logistics

<table>
<thead>
<tr>
<th>Venue</th>
<th>National Capital Region (NCR) / Zoom / Google Meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>October to December 2022</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>25 informants</td>
</tr>
<tr>
<td>Materials</td>
<td>• Participant profile sheets</td>
</tr>
<tr>
<td></td>
<td>• Guide questions</td>
</tr>
<tr>
<td></td>
<td>• Digital or Printed Informed Consent Forms</td>
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<tr>
<td>Supplies</td>
<td>• Laptop</td>
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<td></td>
<td>• Digital recorder</td>
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<td></td>
<td>• Sheets of Paper</td>
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<tr>
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<td>• Acknowledgment receipts</td>
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<tr>
<td></td>
<td>• Attendance sheet</td>
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<tr>
<td></td>
<td>• Food (if face-to-face)</td>
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</tbody>
</table>
Flow

Welcome and Overview (1 minute)
- Introduction of interviewer and interviewee
- Signing of consent forms

Interview Proper (30-40 minutes)
- Individual responses
- Discussion

Closing (5 minutes)
- Wrap-up
- Final notes

Guidelines

1. The participant will be requested to accomplish a profile sheet and to sign the informed consent.
2. The primary researcher shall turn on the digital recorder and record the proceedings of the discussion.
3. The interviewer delivers various questions.
4. The interviewer and interviewee shall discuss the responses and elicit thoughts and opinions.
5. At the end of the interview, the interviewee shall be provided a sheet of paper on which s/he may write down his/her final thoughts, realizations, comments, suggestions, and other notes.

Discussion

<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
</tr>
</thead>
</table>
| Body Image     | 1. Explain if there are body image standards.  
|                | - What are these standards? |
|                | 2. Describe if there are different body image standards for different ethnicities or races.  
|                | - Where are these standards and how are they displayed? Are there specific pages, sites, or platforms? |
|                | 3. Do you think you meet these beauty standards? |
|                | 4. Describe the belief of your friends regarding meeting these standards.  
|                | - Is it hard to meet these standards? Are they realistic?  
|                | - Do you feel pressure to meet these standards? |
|                | 5. Describe if individuals your age care about what they look like.  
|                | - How do individuals your age generally feel about the way they look? |
|                | 6. What do you think the ideal male/female looks like? |
|                | 7. Explain if media in general impact body image.  
|                | - When/how are they harmful?  
<p>|                | - When/how are they helpful? |</p>
<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
</tr>
</thead>
</table>
| 8.                    | What type of media influence your perception towards body image?  
                        | -How do these media platforms influence your perception towards body image?  
                        | *Expound on the topic of how television, movies, or specific social media platforms*                                                                                                                                |
| 9.                    | Why do you think some men and boys wish to be more muscular? Why do you think some women and girls wish to be thinner or slimmer?                                                                                           |
| 10.                   | Explain if you compare your appearance to friends/media.                                                                                                                                                               |
| 11.                   | How do you feel about yourself and your body? Why?  
                        | *Expound on why he/she is feeling that way*                                                                                                                                                                           |
| 12.                   | What are the other factors affecting your perceptions on body image?  
                        | -How do these factors affect body image?                                                                                                                                                                               |
| 13.                   | How does your body image affect your mental well-being?  
                        | -*Expound on how does body image affect his/her mental well-being*                                                                                                                                                     |
| 14.                   | Up to what extent these perceptions on body image affect your mental well-being?                                                                                                                                         |
| 15.                   | Describe if you employ any strategies to cope with negative or positive reactions to your body image.  
                        | -How do these strategies help you?                                                                                                                                                                                     |

| Skin Lightening       | 1. Explain if there are skin tone/color standards.  
                        | -What are these standards?                                                                                                                                                                                             |
|                       | 2. Explain if there are different skin tone standards for different ethnicities or races.  
                        | -Where are these standards and how are they displayed? Are there specific pages, sites, or platforms?                                                                                                               |
|                       | 3. Do you meet these skin tone/color standards?                                                                                                                                                                         |
|                       | 4. Describe your belief if your friends meet these skin tone/color standards.  
                        | -Is it hard to meet these standards? Are they realistic?  
                        | -Do you feel pressure to meet these standards?                                                                                                                                                                         |
|                       | 5. Describe if individuals your age care about skin tone or skin color.  
                        | -How do individuals your age generally feel about the way they look in terms or skin color?                                                                                                                             |
|                       | 6. Describe how media in general impact skin lightening practices.  
                        | -When/how are they harmful?  
<pre><code>                    | -When/how are they helpful?                                                                                                                                                                                             |
</code></pre>
<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
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</thead>
<tbody>
<tr>
<td>7.</td>
<td>What type of media influence your perception towards skin lightening practices?</td>
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<tr>
<td>8.</td>
<td>-How do these media platforms influence your perception towards skin tone/color?</td>
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<tr>
<td>9.</td>
<td><em>Expound on the topic of how television, movies, or specific social media platforms</em></td>
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<td>10.</td>
<td>Why do you think some men or women wish to be whiter/lighter in terms of skin color?</td>
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<tr>
<td>11.</td>
<td>Explain if you compare your skin tone/color to friends/media.</td>
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<td>12.</td>
<td>Describe the use skin lightening products.</td>
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<tr>
<td></td>
<td>-What are these products?</td>
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<td></td>
<td>-When did you start using them?</td>
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<td></td>
<td>-How often do you use these products?</td>
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<tr>
<td>13.</td>
<td>Describe the knowledge on the main ingredients of these skin lightening products.</td>
</tr>
<tr>
<td></td>
<td>-Why did you choose these certain products?</td>
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<tr>
<td>14.</td>
<td>Explain if you think skin lightening practices affect your perception towards body image.</td>
</tr>
<tr>
<td></td>
<td>-How and why?</td>
</tr>
<tr>
<td>15.</td>
<td>How do you feel about yourself and your skin color/tone? Why?</td>
</tr>
<tr>
<td></td>
<td><em>Expound on why he/she is feeling that way</em></td>
</tr>
<tr>
<td>16.</td>
<td>What are the other factors affecting your perceptions on skin lightening practices?</td>
</tr>
<tr>
<td></td>
<td>-How do these factors affect your skin lightening practices?</td>
</tr>
<tr>
<td>17.</td>
<td>How does your skin color/tone affect your mental well-being?</td>
</tr>
<tr>
<td></td>
<td>-<em>Expound on how does skin tone/color affect his/her mental well-being</em></td>
</tr>
<tr>
<td>18.</td>
<td>Up to what extent these perceptions on skin lightening practices affect your mental well-being?</td>
</tr>
<tr>
<td>19.</td>
<td>Describe if you employ any strategies to cope with negative or positive reactions to your skin color/tone.</td>
</tr>
<tr>
<td></td>
<td>-How do these strategies help you?</td>
</tr>
<tr>
<td>Others</td>
<td>20. Are there things that you would like to add in our discussion or you would like to ask?</td>
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<tr>
<td>Article Type</td>
<td>Protocol</td>
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<td>Date Submitted by the Author:</td>
<td>24-Jan-2023</td>
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</table>
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| <b>Primary Subject Heading</b>: | Epidemiology                                  |
| Secondary Subject Heading: | Epidemiology, Mental health, Public health, Qualitative research, Research methods |
| Keywords:       | MENTAL HEALTH, EPIDEMIOLOGY, Anxiety disorders < PSYCHIATRY, Depression & mood disorders < PSYCHIATRY, PUBLIC HEALTH |

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ABSTRACT

Introduction: The rampant distribution of idealized 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 utilized. A cross-sectional study design will involve an online self-administered questionnaire of 1,258 participants, while a case study design will involve in-depth interviews with 25 participants. Data analysis will use generalized linear models and structural equation modeling with a Bayesian network for the quantitative data. Moreover, the qualitative data will utilize an inductive approach in thematic analysis. A contiguous narrative approach will be applied to integrate the quantitative and qualitative data.

Conclusion: This protocol outlined the procedures for future researchers working on a similar mixed-method approach to evaluate the effect of body image perception and skin lightening practices on psychological distress. The results may provide information on the possible inclusion of mental health and body issues as topics in the secondary and tertiary education curricula to teach young minds the importance of caring for both physical and mental health.

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.

Keywords: body image, emerging adults, Filipinos, mental health, mixed methods, skin lightening
STRENGTHS AND LIMITATIONS

1. The mixed methods approach will allow the researchers to capture the complexity of human phenomena, such as the main interests of this research – body image perception and skin lightening practices.

2. The use of a mixed-method approach will allow for greater validity by seeking corroboration between the gathered quantitative and qualitative data.

3. The case study design may be used at various points of the research project, and the ability to explore deeper causes of particular phenomena will be achieved.

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

5. The use of a cross-sectional study design in the quantitative part will not examine the temporal relationships between body image perception, skin lightening practices, and mental health status.

INTRODUCTION

Emerging adulthood represents a developmental period that follows adolescence and precedes adulthood. Various changes will be experienced in this developmental period, including gaining weight. These body changes put them at risk of being dissatisfied with their body appearance. Among emerging adults, there is an increasing trend of observations on body dissatisfaction linked with depression symptoms, psychological distress, and eating disorders. In the Tripartite Influence model, there are three essential factors that became the basis for later development of body image and eating dysfunction: peers, parents, and media. The model also includes two mediational links that connect the influences to disturbed body
image and eating problems: the internalization of the societal standard of appearance and increased tendencies to compare appearances. In a previous study, results showed Filipino males had more significant dysfunction in eating attitudes compared to Europeans, while control over eating and bulimic eating behavior was prominent in Filipino females. These behaviors are eminent in non-Western culture due to the fear of getting fat. On the other hand, 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.

Similar with the body image perception, skin lightening practices became a fixation among emerging adults to modify one’s skin tone as part of developmental phase. Skin-lightening practices are an understudied field in public health; therefore, there is an accentuated need for more epidemiologic research, particularly in underrepresented 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. This perception led to the growing consumption of SLPs, in between and within ethnic/racial groups. A lighter skin tone is seen as a symbol of beauty, attractiveness, and desirability. Among men and women worldwide, the motivation for skin lightening is multifactorial, with the interplay of historical, cultural, sociopolitical, and psychological influences. Many international cosmetic companies have used these motivations to capitalize on this market. Companies manufacturing SLPs utilized different marketing strategies, such as internet marketing and social media public relations. These strategies are implemented to capture racial and colorized norms or values, class, and gender differences within the White and non-White markets. The cultural phenomenon of skin lightening has become widespread in Asia, and it may affect the mental well-being of SLP consumers. In addition, some people use SLP to manage and treat conditions relating to dermatology, including hyperpigmentary melasma, age-induced darkening, and acne.
Homemade formulations using household items combined with SLP are now rampant among consumers. However, the unregulated and unsupervised mixing of SLP with household items may bring dangerous effects, such as ochronosis. Ochronosis is characterized by blue-black hyperpigmentation in the epidermis, dermis, and subcutaneous layers of the skin. The progressive darkening in areas of the skin where hydroquinone-containing cream is applied may be observed in some users.

Furthermore, 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 SLP use is significantly associated with body image disturbances and previous exposure to trauma. Research focused on skin-lightening practices also identified psychological correlates. There are related psychological problems that have been highlighted and are categorized 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.

For the Filipinos, the use of SLP is greatly credited to the damaged psychological state of the Filipino people brought on by American colonial rule. In a more contemporary period, these practices may also be attributed to the tendency to conform to popular culture. 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.

This global pop culture consisting of the media and social media, as well as peer pressures may influence how emerging adults see themselves, as indicated in the Tripartite Influence model. The emerging adult's mental perception of their appearance can become distorted, leading them to engage in risky behaviors 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 even sexual risk behaviors. On the other hand, media also plays an
essential role in encouraging consumers to buy and use SLPs. The media portrayed the lightness of the skin tone as an epitome and a standard for beauty. The essence of body image, beauty, and fair skin tone is the central theme 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 programs 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 scarcity of epidemiologic evidence on mental health disorders in the Philippines is also evident, but some essential information are available. A report estimated that 14% of the 1.4 million Filipinos with disabilities were recognized to have mental health disorders. 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.

This study was conceptualized owing to past literature and a growing body of evidence concerning the effect of body image perception and skin lightening practices on the mental well-being of both men and women. The interplay of body image and skin lightening practices is anchored on the history of racism and modern world globalization in the contemporary context where social media dictate a hegemonized body image and skin color, thus, affecting a person’s mental health status. However, the interaction between body image perception and skin lightening practices among Filipino emerging adults and its overall effect on the
psychological distress of emerging adults remained understudied. Therefore, inclusive and extensive research examining various factors concerning this unfolding 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’ socio-demographic 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 skin lightening products, 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 structural 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 determine the stressors and facilitators among Filipino emerging adults that modified their levels of depression, anxiety, and stress as influenced by their body image perception and skin lightening practices; and

7. To contextualize 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 utilize 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 numerically and narratively. The mixed-method approach's primary purpose is to understand closely the research problems. Therefore, researchers expect that qualitative and quantitative methods will capture the complexity of human phenomena, such as the main interests of this research – body image perception and skin lightening practices. In addition, using a mixed-method approach will provide greater validity by seeking corroboration between the gathered quantitative and qualitative data. This approach will also allow to better understand and interpret the quantitative findings using the findings from the qualitative part of the study. This mixed-method approach includes (1) a Quantitative Part: A cross-sectional study involving an online survey among the intended study population; and (2) a Qualitative Part: A case study involving in-depth interviews of purposively/non-probability selected participants from the quantitative part of the study.
Study Setting

The study will occur from October 2022 to April 2023. This research is the Philippines' first study that will determine the overall effect of the interplay between body image perception and skin lightening practices on Filipino emerging adults' mental health.

Population and Sampling Technique

Study Population

This study will focus on Filipino emerging adults as the sample population. In 2019, it was estimated that about 18.8 million Filipinos are 18-29 years old, which comprises the youth sector of the country. The inclusion and exclusion criteria are as follows:

A. Inclusion Criteria
1. 18-29 years old; and
2. Filipino residing anywhere in the Philippines; and
3. Male or female; and
4. Can understand English and/or Filipino; and
5. Have internet access

B. Exclusion Criteria
1. Refused to provide a signed informed consent form
2. Clinically diagnosed with depression, anxiety, or stress.

Sample Size Calculation, Sampling Technique, and Recruitment Plan

For the online survey, 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, a total sample size of 1,258 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 α-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. Moreover, online tools will be utilized to disseminate the online survey questionnaire. The participants will be recruited using different online platforms to answer the online SAQ voluntarily. These platforms will include the Top 4 social media: Facebook, Twitter, Instagram, and Tiktok. In addition, there will be indicators in the SAQ to screen for valid data, such as a time recording of the response rate and an attention checker between sections of the SAQ. 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.

In qualitative studies, the sample size is based on the number of participants needed to achieve concept saturation. Saturation is 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. Studies showed that as few as 12 participants could be sufficient to explore shared experiences within a group, with 25 informants achieving 99% saturation of concepts. This study will utilize at least 25 informants as theoretical samples to investigate body image perception and skin-lightening practices. It will continue adding more informants until saturation is achieved. The initial 15 informants will include those that have severe/extreme levels of depression (5 informants), anxiety (5 informants), and stress (5 informants) as measured during the quantitative survey. The remaining ten informants will include those with low body image perception status (5 informants) and those practicing skin lightening (5 informants). Random sampling will be employed to select participants for the in-depth interview using the previously described criteria. To minimize selection bias, randomization will be utilized for those chosen based on their outcome scores in the survey (e.g., extremely depressed, extremely anxious, and extremely stressed informants), low body image perception, and practicing skin lightening regimens. In addition, recruitment will be done by selecting the respondents who answered the online survey. Suppose 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.

**Data Collection Procedure**

**Quantitative Part: Cross-Sectional Survey**

The study will involve creating and distributing a Self-Administered Questionnaire (SAQ). The SAQ will comprise sections of demographic data (age, sex, sexual orientation), socio-economic status (average monthly household income, occupation, highest educational attainment, 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 survey will be distributed in English using the Qualtrics XM™ platform. Informed consent detailing the purpose, risks, benefits, methods, and other ethical considerations will be included before the participants can answer the online survey. Before the survey's release, the SAQ shall undergo pilot pre-testing among twenty (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 hypothesized structural model. Three observed indicators will be used to build a measurement model around body image perception: Body Appreciation Scale (BAS-2), Body Esteem Scale (BES), and Positive Rational Acceptance Scale (PRAS). 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. One of the first measurements developed was the scale for BAS. 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 behaviors, and safeguard the body by enduring the influence of narrow beauty standards promoted in the media.\textsuperscript{56} On the other hand, the BES for adolescents and adults is widely utilized to assess cognitive and affective features of body image perception.\textsuperscript{57} Lastly, another well-accepted body image perception scale measures positive rational acceptance coping. One researcher presented the dynamic arrangements undertaken among distal socio-developmental predisposing factors that led to a person’s current experience of body image perception.\textsuperscript{58} 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 holistically measure one’s perception of body image.

BAS-2 is easy to administer and score. For each item, the following response scale will be used: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, and 5 = Always.\textsuperscript{59} Previous research found a unidimensional factor structure, strong internal consistency (Cronbach’s $\alpha = 0.97$), construct validity, and test-retest reliability ($r = 0.90$) in community and college samples of men and women. Additionally, the internal consistency of the BAS-2 was excellent (Cronbach’s $\alpha = 0.954$, McDonald’s $\omega = 0.956$).\textsuperscript{60} On the other hand, BES was designed for young adults, both men and women, and validated among college students.\textsuperscript{61} The scale represents multiple dimensions that differ for men and women.\textsuperscript{62} 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.\textsuperscript{63} PRAS, in particular, has been conceptualized and designed as an adaptive affect...
regulation mechanism when the body is exposed to body image challenges.\textsuperscript{64} Generally, PRAS involves positive self-talk, such as reminding oneself of the transience of experiencing negative body image-related feelings in the aftermath of a threat, and is positively associated, although weakly, with more general adaptive emotional regulation strategies.\textsuperscript{65} With these reports, PRA may bridge the link between nature exposure and positive body image\textsuperscript{66}. Participants will be asked to complete an 11-item PRA subscale of the body image coping strategies inventory (BICSI).\textsuperscript{64} Scores on the BICSI have been shown to have adequate factorial and construct validity and internal consistency. Cronbach's $\alpha$ for PRA scores was 0.85 (95% CI = 0.83–0.87).\textsuperscript{64}

The questionnaire on skin lightening practices will be adapted from a previous study conducted in Southeast Asia, including Indonesia, Malaysia, Myanmar, Thailand, and Vietnam.\textsuperscript{67} Knowledge of SLP will be assessed with two questions, (a) the awareness that SLP can harm the skin; and (b) knowing the active ingredients in SLP.\textsuperscript{23} Perceptions about a lighter skin tone and SLP will be assessed with eight items. Response options will range from 1 = strongly agree 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 1 = never to 4 = more than ten times, respectively.\textsuperscript{68}

**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 constructs of depression and anxiety and to address the failure of earlier emotional measures in discriminating between anxiety and depression.\textsuperscript{69} DASS-21 has been previously used in American,\textsuperscript{70} European,\textsuperscript{71} and Asian\textsuperscript{72-75} populations. Each of the three DASS-21 scales contains seven items, divided into subscales with similar content. 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).

Socio-Demographic Variables and Levels of Media Exposure

The socio-demographic variables will also be ascertained and were selected a priori based on previous literature. 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 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.

Qualitative Part: Case Study

Concept notes will be developed focusing on the extraneous factors affecting the participants’ body image perception, skin-lightening practices, and mental health status. Some salient topics will include current stressors (e.g., 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 primary researcher 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. 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, standard deviation, and range for continuous variables to answer Specific Aim Nos. 1-3. Differences in the socio-demographic characteristics between participants will be assessed using t-tests (for continuous variables) and Chi-square 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 socio-demographic 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 generalized linear models, a standard method for analyzing data in cross-sectional studies. Depending on how rare or common the mental health status outcomes are, generalized 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% confidence interval (95% CI), respectively.98-101 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 modeling (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.\textsuperscript{102} 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, i.e., with a variance of 1 and a mean of zero. The MLE method estimates parameters and their standard error 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.\textsuperscript{103} \textsuperscript{104} Results will be presented as standardized loadings, interpreted as probit regression coefficients.\textsuperscript{102} All analyses will be done in R software.

\textbf{Qualitative Part: Case Study}

This part of the data analysis will answer Specific Aim No. 6. After transcribing the interviews, the data transcripts will be analyzed using NVivo 1.6.2 software\textsuperscript{105} by three research team members independently utilizing the inductive logic approach in thematic analysis: familiarizing with the data, generating initial codes, searching for themes, reviewing the themes, defining and naming the themes, and producing the report.\textsuperscript{106} Data familiarization 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 categorized to identify distinct concepts and themes.\textsuperscript{107}

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.\textsuperscript{108} The researchers will begin by coding each line of each patient 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 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 analyzing the data will continue until saturation is reached. Finally, pseudonyms will be used to present quotes from the qualitative data.

\textit{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. Integration of qualitative and quantitative
data at the interpretation and reporting level will occur through joint displays.\textsuperscript{109, 110} When integrating through joint displays, the primary researcher 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 organizing related data in a figure, table, matrix, or graph.\textsuperscript{111-113} Figure 2 shows this 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 survey 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 survey or in-depth interviews should be consistent, clarified, and corrected.

Handling Missing Data

All responses in the SAQ using the Qualtrics XM\textsuperscript{TM} will be forced. However, there are instances where missing data will be observed. 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. Moreover, multiple imputations will be used to analyze 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.\textsuperscript{114,115}

**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 (NEGHHRR) 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 primary researcher. 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 upon 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 six (6) months but will be stored for up to three (3) years.

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

DISCUSSION

The topic of mental health has received a remarkable increase in global attention. Over time, trends showed an increasing number of people suffering from depressive disorders. The worldwide rise in the incidence of mental health disorders prompted researchers to investigate more, on this phenomenon. In addition, a growing body of literature outlines the undesirable mental health consequences of body issues, including body image perception and skin lightening practices. Previous research outlined the issues of body appearances leading to unhealthy weight control behaviors that are sometimes excessive or detrimental to one’s mental health. Moreover, reports have suggested an association between a pattern of poor mental health status and the use of SLPs.

Similarly, the explanation speculated behind the psychological determinants of skin lightening practices suggests that symptoms of poor mental health are linked with deficits in self-esteem or body image. The psychological effect for many people to lighten one’s skin to fit within the larger society’s definition of beauty is now more rampant than ever. Moreover, using SLP gives people a sense of belongingness in the community where acceptance of beauty standards is inevitable. Hence, using SLP may also be viewed as a destressing and coping mechanism.

The biological and psychosocial phenomenon of skin lightening involves the observed interaction among three essential factors in the process of skin lightening: the motivation to do it, the different practices and the effects of this practice, and even the prevention and treatment (support) processes. From the perspective of anthropologists, the physical and social realities are present in human skin. Across different cultures, the skin is considered a physical
entity that communicates status symbol in the society. According to Turner’s concept of “social skin,” the skin represents a person’s political, cultural, and social identity. The essence of classification through skin color, stigma, and preferences for lighter skin tones was accentuated through the rampant increase in SLPs available in the consumer market.

Furthermore, Turner considered skin an identity marker that gives an individual an element of belongingness, classification, recognition, distinction, and pride. SLP and its related practices have detrimental effects on body image perception and self-image. It may be deeply embedded in a person’s overall cognitive and emotional evaluation of their self-esteem, summation of beliefs about his/herself, and other factors or drivers that affect their thoughts, personality, and behavior. Sometimes, extreme dislike or hatred against oneself drives one to lighten the skin. The transgenerational residual after-effects of discrimination, apartheid, and colonialism still drive many people to lighten their skin. Many women still consider white or light skin tone attractive, and darker skin may be associated with negative subtexts, including ugliness, evil, disease, and dirt.

However, little is known about the interaction of various factors relating to body appearance and beauty standards problems. 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 and mental health. The link between body image perception, skin-lightening practices, and the mental health status of Filipino emerging adults is not fully understood. Moreover, 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.

This study will focus 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 may help them understand how the interplay of body image perception and skin-lightening practices and their effect on the 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 and safe skin-lightening practices to support good mental health concerning our bodies. This study may be a stepping stone to providing evidence on how effectively regulating body image and safe skin lightening practices are portrayed in the Philippines. In addition, the results of this study may give the Education Department at secondary and tertiary levels the foundation to include and promote positive body image perception, safe skin lightening practices, and mental health status in the current curriculum. Furthermore, the Department can include it through the inculcation of body and skin tone diversity in the early education learning stages of the students.

**Figure Legends**

Figure 1. Structural model for the exposure, mediator, and outcome variables

Figure 2. Implementation Matrix for the proposed explanatory sequential mixed-method study

**Contributors:** All persons listed as authors 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. ZGR conceived the study with the guidance from ESB. ZGR conceptualized and designed the protocol. ESB, MJL, JPG, MG, and JCM contributed to the introduction, methods and analysis, strengths and limitations, and discussion. All authors reviewed and approved the manuscript.
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**REFERENCES**


22. Rusmadi SZ, Syed Ismail SN, Praveena SM. Preliminary study on the skin lightening practice and health symptoms among female students in Malaysia. *Journal of environmental and public health* 2015;2015


33. Singson F. Colonialism's Role in the Success of the Filipino Skin Whitening Industry. 2017


46. Nagpal D, Kornerup I, Gibson MP. Mixed-method Research: A Basic Understanding. 2020


78. Lovibond SH, Lovibond PF. Depression anxiety and stress scales (DASS). 2013


84. Ramesh J. Study on Society’s influence on Women’s portrayal in the Indian Media with special reference to Advertising and Movies. 2019


126. Santiago-Delefosse M. Psychologie de la santé. Perspectives qualitatives et cliniques 2002


**Figure 1.** Structural model for the exposure, mediator, and outcome variables.

Figure 2. Implementation matrix for the proposed explanatory sequential mixed-method study.
The objective of this study is to gather data and form insights relevant to perceptions of body image and skin lightening practices of emerging Filipino adults. As a first step, in-depth interview will be conducted to gain knowledge and discover relevant themes and topics. This study is purposely targeted towards both male or female aged 18-29 years in the Philippines. Specifically, it aims to determine stressors and facilitators among emerging Filipino adults that modified their mental status as influenced by their body image perceptions and skin lightening practices. Salient topics will include current stressors (e.g., personal, social, familial), emotional reactions to these stressors, and facilitators that allow them modify their body or lighten their skin.

Each interview is expected to run for approximately 30 to 45 minutes.

**Logistics**

<table>
<thead>
<tr>
<th>Venue</th>
<th>National Capital Region (NCR) / Zoom / Google Meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>October 2022 to February 2023</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>25 informants</td>
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<tr>
<td>Materials</td>
<td>• Participant profile sheets</td>
</tr>
<tr>
<td></td>
<td>• Guide questions</td>
</tr>
<tr>
<td></td>
<td>• Digital or Printed Informed Consent Forms</td>
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<tr>
<td>Supplies</td>
<td>• Laptop</td>
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<tr>
<td></td>
<td>• Digital recorder</td>
</tr>
<tr>
<td></td>
<td>• Sheets of Paper</td>
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<tr>
<td></td>
<td>• Acknowledgment receipts</td>
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<tr>
<td></td>
<td>• Attendance sheet</td>
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<tr>
<td></td>
<td>• Food (if face-to-face)</td>
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</tbody>
</table>
Flow

Welcome and Overview (1 minute)
- Introduction of interviewer and interviewee
- Signing of consent forms

Interview Proper (30-40 minutes)
- Individual responses
- Discussion

Closing (5 minutes)
- Wrap-up
- Final notes

Guidelines

1. The participant will be requested to accomplish a profile sheet and to sign the informed consent.
2. The primary researcher shall turn on the digital recorder and record the proceedings of the discussion.
3. The interviewer delivers various questions.
4. The interviewer and interviewee shall discuss the responses and elicit thoughts and opinions.
5. At the end of the interview, the interviewee shall be provided a sheet of paper on which s/he may write down his/her final thoughts, realizations, comments, suggestions, and other notes.

Discussion

<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Image</td>
<td>1. Tell me about what messages you’ve received about the ideal body. (Probe for sources of information)</td>
</tr>
<tr>
<td></td>
<td>2. Do you think there are different body ideals for different ethnicities or races or not? How do they differ?</td>
</tr>
<tr>
<td></td>
<td>3. Do you think you meet these beauty standards or not? Why do you say so? Would you like to meet them or not? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>4. How do your friends feel regarding meeting these body standards?</td>
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<tr>
<td></td>
<td>-How are body standards met? Are they realistic or not? How does it affect one’s health?</td>
</tr>
<tr>
<td></td>
<td>-Do you feel pressure to meet these body standards or not? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>5. Kindly describe if individuals your age care about how they look like.</td>
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<tr>
<td></td>
<td>-How do individuals your age generally feel about the way they look?</td>
</tr>
<tr>
<td></td>
<td>6. What do you think the ideal male/female looks like?</td>
</tr>
<tr>
<td></td>
<td>7. How has the media in general impacted body image?</td>
</tr>
<tr>
<td></td>
<td>-When/how are they harmful?</td>
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<tr>
<td></td>
<td>-When/how are they helpful?</td>
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<tr>
<td>Topic</td>
<td>Discussion Questions</td>
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<tr>
<td>8.</td>
<td><strong>What type of media influence your perception towards body image?</strong> &lt;br&gt;-How do these media platforms influence your perception towards body image? &lt;br&gt;<em>Expound on the topic of how television, movies, or specific social media platforms</em></td>
</tr>
<tr>
<td>9.</td>
<td><strong>Why do you think people want to change their bodies?</strong></td>
</tr>
<tr>
<td>10.</td>
<td><strong>Do you compare your appearance to friends/media?</strong></td>
</tr>
<tr>
<td>11.</td>
<td><strong>How do you feel about yourself and your body? Why?</strong> &lt;br&gt;<em>Expound on why he/she is feeling that way</em></td>
</tr>
<tr>
<td>12.</td>
<td><strong>What else affects your perceptions about your body? How do these affect body image?</strong></td>
</tr>
<tr>
<td>13.</td>
<td><strong>How does your perception of body image affect your mental well-being?</strong> &lt;br&gt;<em>Expound on how does body image affect his/her mental well-being</em></td>
</tr>
<tr>
<td>14.</td>
<td><strong>How do you cope with negative reactions to your body? How do these strategies help you?</strong></td>
</tr>
<tr>
<td>Skin Lightening</td>
<td>1. <strong>Tell me about what messages you’ve received about the ideal skin tone?</strong> (Probe for sources of information) &lt;br&gt;-What are these standards? Please describe.</td>
</tr>
<tr>
<td></td>
<td>2. <strong>Do you think there are different ideal skin tone for different ethnicities or races? How do they differ?</strong></td>
</tr>
<tr>
<td></td>
<td>3. <strong>Do you think you meet these skin tone/color standards or not? Why do you say so? Would you like to meet them or not? Why or why not?</strong></td>
</tr>
<tr>
<td></td>
<td>4. <strong>How do your friends feel regarding meeting these standards? Is it hard to meet these standards or not? Are they realistic or not? Why or why not?</strong> &lt;br&gt;-Do you feel pressure to meet these standards or not? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>5. <strong>Kindly describe if individuals your age care about skin tone or skin color.</strong> &lt;br&gt;-How do individuals your age generally feel about the way they look in terms or skin color?</td>
</tr>
<tr>
<td></td>
<td>6. <strong>How has the media in general impacted body image?</strong> &lt;br&gt;-When/how are they harmful? &lt;br&gt;-When/how are they helpful?</td>
</tr>
<tr>
<td></td>
<td>7. <strong>What type of media influence your perception towards skin lightening practices?</strong></td>
</tr>
<tr>
<td></td>
<td>8. <strong>How do these media platforms influence your perception towards skin tone/color?</strong></td>
</tr>
<tr>
<td>Topic</td>
<td>Discussion Questions</td>
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<tr>
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</tr>
<tr>
<td>9.</td>
<td><em>Expound on the topic of how television, movies, or specific social media platforms</em></td>
</tr>
<tr>
<td>10.</td>
<td>Why do you think some men or women wish to be whiter/lighter in terms of skin color?</td>
</tr>
<tr>
<td>11.</td>
<td>Do you compare your skin tone to friends/media?</td>
</tr>
</tbody>
</table>
| 12.   | Describe the use skin lightening products.  
|       | - What are these products?  
|       | - When did you start using them?  
|       | - How often do you use these products? |
| 13.   | Describe the knowledge on the main ingredients of these skin lightening products.  
|       | - Why did you choose these certain products? |
| 14.   | Do you think skin lightening practices affect your perception towards body image?  
|       | - How and why? |
| 15.   | How do you feel about yourself and your skin color/tone? Why?  
|       | *Expound on why he/she is feeling that way* |
| 16.   | What else affects your perceptions about your skin tone?  
|       | - How do these affect your skin lightening practices? |
| 17.   | How does your skin color/tone affect your mental well-being?  
|       | *Expound on how does skin tone/color affect his/her mental well-being* |
| 18.   | Do you do anything to cope with negative reactions to your skin tone? How do these strategies help you? |

**Others**

| 19.   | Are there things that you would like to add in our discussion that we have not discussed yet? Is there anything that you would like to ask? |

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| Complete List of Authors: | Regencia, Zypher Jude; University of the Philippines Manila, Department of Clinical Epidemiology; University of the Philippines Manila National Institutes of Health, Institute of Clinical Epidemiology
|                  | Gouin, Jean-Philippe; Concordia University, Department of Psychology, Faculty of Arts and Science
|                  | Ladia, Mary Ann J.; University of the Philippines Manila, Department of Clinical Epidemiology; University of the Philippines Manila National Institutes of Health, Institute of Clinical Epidemiology
|                  | Montoya, Jaime; University of the Philippines Manila College of Medicine, Department of Medicine
|                  | Baja, Emmanuel; University of the Philippines Manila College of Medicine, Department of Clinical Epidemiology; University of the Philippines Manila National Institutes of Health, Institute of Clinical Epidemiology
| Primary Subject Heading | Epidemiology          |
| Secondary Subject Heading | Epidemiology, Mental health, Public health, Qualitative research, Research methods |
| Keywords         | MENTAL HEALTH, EPIDEMIOLOGY, Anxiety disorders < PSYCHIATRY, Depression & mood disorders < PSYCHIATRY, PUBLIC HEALTH |

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ABSTRACT

Introduction: The rampant distribution of idealized 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 utilized. A cross-sectional study design will involve an online self-administered questionnaire of 1,258 participants, while a case study design will involve in-depth interviews with 25 participants. Data analysis will use generalized linear models and structural equation modeling with a Bayesian network for the quantitative data. Moreover, the qualitative data will utilize an inductive approach in thematic analysis. A contiguous narrative approach will integrate the quantitative and qualitative data.

Conclusion: This protocol outlined the procedures for future researchers working on a similar mixed-method approach to evaluate the effect of body image perception and skin lightening practices on psychological distress. The results may provide information on the possible inclusion of mental health and body issues as topics in the secondary and tertiary education curricula to teach young minds the importance of caring for both physical and mental health.

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.

Keywords: body image, emerging adults, Filipinos, mental health, mixed methods, skin lightening
STRENGTHS AND LIMITATIONS

1. The mixed methods approach will allow the researchers to capture the complexity of human phenomena, such as the main interests of this research – body image perception and skin lightening practices.

2. The use of a mixed-method approach will allow for greater validity by seeking corroboration between the gathered quantitative and qualitative data.

3. The case study design may be used at various points of the research project, and the ability to explore deeper causes of particular phenomena will be achieved.

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

5. The use of a cross-sectional study design in the quantitative part will not examine the temporal relationships between body image perception, skin lightening practices, and mental health status.

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 internalization 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 to Europeans, while control over eating and bulimic eating behavior was prominent in Filipino females. These behaviors 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 underrepresented 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 capitalize on this market. Companies manufacturing SLPs utilized 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 categorized 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 behaviors 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 behaviors. 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.

**Mental Health Landscape in the Philippines**

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 programs 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 programs are not in place.

**Background of the Study**

This study was conceptualized from a growing number of theoretical and empirical studies on body image perception, skin lightening practices, and the mental well-being of both men and women. The interplay of body image and skin lightening practices is anchored on the history of racism and modern world globalization in the contemporary context where social
media dictate a hegemonized body image and skin color, thus, affecting a person’s mental health status. However, the interaction between body image perception and skin lightening 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 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’ socio-demographic 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 skin lightening products, 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; and

7. To contextualize 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 utilize 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.\textsuperscript{49} We expect that qualitative and quantitative methods will capture the complexity of body image concerns and skin lightening practices.\textsuperscript{50, 51} This approach will also allow us to better understand and interpret the quantitative findings using the findings from the qualitative part of the study.\textsuperscript{50, 52, 53} This mixed-method approach includes (1) a Quantitative Part: a cross-sectional study 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.

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;
4. Can understand English; and
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, a total minimum sample size of 1,258 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 α-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 4 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. 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.

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. Studies showed that as few as 12 participants could be sufficient to explore shared
experiences within a group, with 25 informants achieving 99% saturation of concepts. This
study will utilize 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 (5 informants), anxiety (5 informants), and stress (5
informants) as measured during the quantitative survey. The remaining ten informants will
include those with no body image concerns (5 informants) and those practicing skin
lightening (5 informants). Random sampling will be employed to select participants for the in-depth
interview using the previously described criteria. In addition, to minimize selection bias,
randomization will be utilized for those chosen based on their outcome scores in the
questionnaire (e.g., 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.

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), socio-economic 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 included 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 hypothesized structural model. Three observed indicators will be used to build a measurement model around body image perception: Body Appreciation Scale (BAS-2), Body Esteem Scale (BES), and Positive Rational Acceptance Scale (PRAS). 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 behaviors, and safeguard the body by enduring the influence of narrow beauty standards promoted in the media. For each item, the following response scale will be used: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, and 5 = Always. Previous research found a unidimensional factor structure, strong internal consistency (Cronbach’s $\alpha = 0.97$), 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. Additionally, the internal consistency of the BAS-2 was excellent (Cronbach’s $\alpha = 0.954$, McDonald’s $\omega = 0.956$).

BES for adolescents and adults is widely utilized to assess cognitive and affective features of body image perception. BES was designed for both men and women young adults and validated among college students. The scale represents distinct dimensions for men and women. 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.

Lastly, another well-accepted body image perception scale measures positive rational acceptance coping. PRAS has been conceptualized and designed as an adaptive affect regulation mechanism when the body is exposed to body image challenges. 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. Participants will be asked to complete an 11-item PRAS of the body image coping strategies inventory (BICSI). 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 - 0.87).

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 range from 1 = strongly agree, 2 = agree, 3 = disagree, to 4 = strongly disagree (Cronbach's α = 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 1 = never, 2 = , 3 = , to 4 = more than ten times, 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).82

Socio-Demographic Variables and Levels of Media Exposure

Based on previous literatures, the socio-demographic variables will be ascertained and selected a priori. These variables include age,83-87 sex at birth,88-90 sexual orientation,91-93 household income,90 94 working status,90 95 highest educational attainment,90 95 relationship status,96 97 and type of residence.98 99

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.100 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 (e.g., 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. 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, standard deviation, and range for continuous variables to answer Specific Aim Nos. 1-3. Differences in the socio-demographic characteristics between participants will be assessed using t-tests (for continuous variables) and Chi-square 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 socio-demographic 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 generalized linear models. Depending on how common the mental health outcomes are, generalized 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% confidence interval (95% CI), respectively.\textsuperscript{101-104} 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
modeling (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, i.e., with a variance of 1 and a mean of zero. The MLE method estimates parameters and their standard error 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 standardized 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 analyzed using NVivo 1.6.2 software by three research team members independently utilizing the inductive logic approach in thematic analysis: familiarizing with the data, generating initial codes, searching for themes, reviewing the themes, defining and naming the themes, and producing the report.

Data familiarization 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 categorized to identify distinct concepts and themes.\textsuperscript{110}

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.\textsuperscript{111} 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 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 analyzing 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. 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 organizing related data in a figure, table, matrix, or graph. Two researchers will be involved in the quantitative and qualitative data triangulation. Should there be disagreements, again the principal investigator together with the multi-disciplinary 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.\textsuperscript{117} \textsuperscript{118} Multiple imputations will be used to analyze 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.\textsuperscript{117} \textsuperscript{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 (NEGHHRR) 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 upon 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 six (6) months but will be stored for up to three (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. 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. Reports have also suggested an association between a pattern of better mental health status and using SLPs.

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, and not the combination. Furthermore, these local studies on body image and mental health mainly tackled body dissatisfaction and depression. In contrast, local
studies on skin-lightening practices specifically discussed how colonialism affected how Filipinos think about skin color.¹³⁷ ¹³⁸

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 to include and promote positive body image perception, safe skin-lightening practices, and mental health status in the current curriculum. Furthermore, the Education Department can 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.

**Figure Legends**

Figure 1. Structural model for the exposure, mediator, and outcome variables

Figure 2. Implementation Matrix for the proposed explanatory sequential mixed-method study

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**REFERENCES**


36. Singson F. Colonialism's Role in the Success of the Filipino Skin Whitening Industry. 2017


87. Ramesh J. Study on Society s influence on Women s portrayal in the Indian Media with special reference to Advertising and Movies. 2019


118. Fox-WASYLYSHYN SM, El-MASRI MM. Handling missing data in self-report measures. 

119. SAXENA S, FUNK M, CHISHOLM D. World health assembly adopts comprehensive mental 

120. LEVINSON D, LAKOMA MD, PETUKHOVA M, et al. Associations of serious mental illness with 
   earnings: results from the WHO World Mental Health surveys. The British Journal of 

121. LÉPINE J-P, BRILEY M. The increasing burden of depression. Neuropsychiatric disease and 

122. ANDREW R, TIGGEMANN M, CLARK L. The protective role of body appreciation against 

123. ANDREW R, TIGGEMANN M, CLARK L. Positive body image and young women’s health: 
   Implications for sun protection, cancer screening, weight loss and alcohol consumption 

124. TYLKA TL. Overview of the field of positive body image. Body positive: Understanding 

125. SWAMI V, WEIS L, BARRON D, et al. Positive body image is positively associated with 
   hedonic (emotional) and eudaimonic (psychological and social) well-being in British 

126. DLOVA NC, HAMED SH, TSOKA-GWEGWENI J, et al. Skin lightening practices: an 
   epidemiological study of South African women of African and Indian ancestries. 

127. YA AZIBO DA. Teaching the mulatto hypothesis to combat African-US colorism: Just 
   knowing can cure. Race, Gender & Class 2014:88-100.


132. Santiago-Delefosse M. Psychologie de la santé. *Perspectives qualitatives et cliniques* 2002


**Figure 1.** Structural model for the exposure, mediator, and outcome variables.

Figure 2. Implementation matrix for the proposed explanatory sequential mixed-method study.
**SUPPLEMENTAL FILE 1**  
**In-depth Interview**  
Guides and Discussion Questions

### Objectives and Participants

The objective of this study is to gather data and form insights relevant to perceptions of body image and skin lightening practices of emerging Filipino adults. As a first step, an in-depth interview will be conducted to gain knowledge and discover relevant themes and topics.

This study is purposely targeted towards both male or female aged 18-29 years in the Philippines. Specifically, it aims to determine stressors and facilitators among emerging Filipino adults that modified their mental status as influenced by their body image perceptions and skin lightening practices. Salient topics will include current stressors (e.g., personal, social, familial), emotional reactions to these stressors, and facilitators that allow them to modify their body or lighten their skin.

Each interview is expected to run for approximately 30 to 45 minutes.

### Logistics

<table>
<thead>
<tr>
<th>Venue</th>
<th>National Capital Region (NCR) / Zoom / Google Meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>October 2022 to February 2023</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>25 informants</td>
</tr>
</tbody>
</table>
| Materials           | • Participant profile sheets  
|                     | • Guide questions  
|                     | • Digital or Printed Informed Consent Forms       |
| Supplies            | • Laptop  
|                     | • Digital recorder  
|                     | • Sheets of Paper  
|                     | • Acknowledgment receipts  
|                     | • Attendance sheet  
|                     | • Food (if face-to-face) |
Flow

| Welcome and Overview (1 minute) | • Introduction of interviewer and interviewee  
|                                 | • Signing of consent forms |
| Interview Proper (30-40 minutes) | • Individual responses  
|                                  | • Discussion |
| Closing (5 minutes)             | • Wrap-up  
|                                  | • Final notes |

Guidelines

1. The participant will be requested to accomplish a profile sheet and to sign the informed consent.
2. The primary researcher shall turn on the digital recorder and record the proceedings of the discussion.
3. The interviewer delivers various questions.
4. The interviewer and interviewee shall discuss the responses and elicit thoughts and opinions.
5. At the end of the interview, the interviewee shall be provided a sheet of paper on which s/he may write down his/her final thoughts, realizations, comments, suggestions, and other notes.

Discussion

<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Image</td>
<td>1. Tell me about what messages you’ve received about the ideal body. (Probe for sources of information)</td>
</tr>
<tr>
<td></td>
<td>2. Do you think there are different body ideals for different ethnicities or races or not? How do they differ?</td>
</tr>
<tr>
<td></td>
<td>3. Do you think you meet these beauty standards or not? Why do you say so? Would you like to meet them or not? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>4. How do your friends feel regarding meeting these body standards?</td>
</tr>
<tr>
<td></td>
<td>- How are body standards met? Are they realistic or not? How does it affect one’s health?</td>
</tr>
<tr>
<td></td>
<td>- Do you feel pressure to meet these body standards or not? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>5. Kindly describe if individuals your age care about how they look like.</td>
</tr>
<tr>
<td></td>
<td>- How do individuals your age generally feel about the way they look?</td>
</tr>
<tr>
<td></td>
<td>6. What do you think the ideal male/female looks like?</td>
</tr>
<tr>
<td></td>
<td>7. How has the media in general impacted body image?</td>
</tr>
<tr>
<td></td>
<td>- When/how are they harmful?</td>
</tr>
<tr>
<td></td>
<td>- When/how are they helpful?</td>
</tr>
<tr>
<td>Topic</td>
<td>Discussion Questions</td>
</tr>
<tr>
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<td>----------------------</td>
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</tbody>
</table>
|       | 8. What type of media influence how you see your body?  
|       | -How do these media platforms influence your perception towards body image?  
|       | *Expound on the topic of how television, movies, or specific social media platforms*  
|       | 9. Why do you think people want to change their bodies?  
|       | 10. Do you compare your appearance to friends/media?  
|       | 11. How do you feel about yourself and your body? Why?  
|       | *Expound on why he/she is feeling that way*  
|       | 12. What else affects how you see your body? How do these affect body image?  
|       | 13. How does your way of seeing your body affect your mental well-being?  
|       | *Expound on how does body image affect his/her mental well-being*  
|       | 14. How do you cope with negative feeling towards your body? How do these strategies help you?  
| Skin Lightening | 1. Tell me about what messages you’ve received about the ideal skin tone? (Probe for sources of information)  
|     | -What are these standards? Please describe.  
|     | 2. Do you think there are different ideal skin tone for different ethnicities or races? How do they differ?  
|     | 3. Do you think you meet these skin tone/color standards or not? Why do you say so? Would you like to meet them or not? Why or why not?  
|     | 4. How do your friends feel regarding meeting these standards? Is it hard to meet these standards or not? Are they realistic or not? Why or why not?  
|     | -Do you feel pressure to meet these standards or not? Why or why not?  
|     | 5. Kindly describe if individuals your age care about skin tone or skin color.  
|     | -How do individuals your age generally feel about the way they look in terms or skin color?  
|     | 6. How has the media in general impacted body image?  
|     | -When/how are they harmful?  
|     | -When/how are they helpful?  
|     | 7. What type of media influence your perception towards skin lightening practices?  
|     | 8. How do these media platforms influence your perception towards skin tone/color?  
|     | 9. Why do you think people want to change their bodies?
<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td><em>Expound on the topic of how television, movies, or specific social media platforms</em></td>
</tr>
<tr>
<td>10.</td>
<td>Why do you think some men or women wish to be whiter/lighter in terms of skin color?</td>
</tr>
<tr>
<td>11.</td>
<td>Do you compare your skin tone to friends/media?</td>
</tr>
</tbody>
</table>
| 12.   | Describe the use of skin lightening products.  
- What are these products?  
- When did you start using them?  
- How often do you use these products? |
| 13.   | Describe the knowledge on the main ingredients of these skin lightening products.  
- Why did you choose these certain products? |
| 14.   | Do you think skin lightening practices affect how you see your body?  
- How and why? |
| 15.   | How do you feel about yourself and your skin color/tone? Why?  
*Expound on why he/she is feeling that way* |
| 16.   | What else affects your perceptions about your skin tone?  
- How do these affect your skin lightening practices? |
| 17.   | How does your skin color/tone affect your mental well-being?  
*Expound on how does skin tone/color affect his/her mental well-being* |
| 18.   | Do you do anything to cope with negative feelings towards your skin tone? How do these strategies help you? |
| Others| 19. Are there things that you would like to add in our discussion that we have not discussed yet? Is there anything that you would like to ask? |

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| Secondary Subject Heading: | Epidemiology, Mental health, Public health, Qualitative research, Research methods |
| Keywords:       | MENTAL HEALTH, EPIDEMIOLOGY, Anxiety disorders < PSYCHIATRY, Depression & mood disorders < PSYCHIATRY, PUBLIC HEALTH |

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ABSTRACT

Introduction: The rampant distribution of idealized 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 utilized. A cross-sectional study design will involve an online self-administered questionnaire of 1,258 participants, while a case study design will involve in-depth interviews with 25 participants. Data analysis will use generalized linear models and structural equation modeling with a Bayesian network for the quantitative data. Moreover, the qualitative data will utilize 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.

Keywords: body image, emerging adults, Filipinos, mental health, mixed methods, skin lightening
STRENGTHS AND LIMITATIONS

1. The mixed methods approach will allow the researchers to capture the complexity of human phenomena, such as the main interests of this research – body image perception and skin lightening practices.

2. The use of a mixed-method approach will allow for greater validity by seeking corroboration between the gathered quantitative and qualitative data.

3. The case study design may be used at various points of the research project, and the ability to explore deeper causes of particular phenomena will be achieved.

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

5. The use of a cross-sectional study design in the quantitative part will not examine the temporal relationships between body image perception, skin lightening practices, and mental health status.

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 internalization 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 to Europeans, while control over eating and bulimic eating behavior was prominent in Filipino females. These behaviors 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 underrepresented 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 capitalize on this market. Companies manufacturing SLPs utilized 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 categorized 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 behaviors 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 behaviors. 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.

**Mental Health Landscape in the Philippines**

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 programs 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 programs are not in place.

**Background of the Study**

This study was conceptualized from a growing number of theoretical and empirical studies on body image perception, skin lightening practices, and the mental well-being of both men and women. The interplay of body image and skin lightening practices is anchored on the history of racism and modern world globalization in the contemporary context where social
media dictate a hegemonized body image and skin color, thus, affecting a person's mental health status. However, the interaction between body image perception and skin lightening 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\(^9\) 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' socio-demographic 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 skin lightening products, 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; and

7. To contextualize 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 utilize 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.\textsuperscript{49} We expect that qualitative and quantitative methods will capture the complexity of body image concerns and skin lightening practices.\textsuperscript{50, 51} This approach will also allow us to better understand and interpret the quantitative findings using the findings from the qualitative part of the study.\textsuperscript{50, 52, 53} This mixed-method approach includes (1) a Quantitative Part: a cross-sectional study 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.

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;
4. Can understand English; and
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, a total minimum sample size of 1,258 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 α-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 4 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. 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.

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.\textsuperscript{56,57} Studies showed that as few as 12 participants could be sufficient to explore shared experiences within a group,\textsuperscript{58} with 25 informants achieving 99\% saturation of concepts.\textsuperscript{59} This study will utilize 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 (5 informants), anxiety (5 informants), and stress (5 informants) as measured during the quantitative survey. The remaining ten informants will include those with no body image concerns (5 informants) and those practicing skin lightening (5 informants). Random sampling will be employed to select participants for the in-depth interview using the previously described criteria. In addition, to minimize selection bias, randomization will be utilized for those chosen based on their outcome scores in the questionnaire (e.g., 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.

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), socio-economic 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 included 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 hypothesized structural model. Three observed indicators will be used to build a measurement model around body image perception: Body Appreciation Scale (BAS-2), Body Esteem Scale (BES), and Positive Rational Acceptance Scale (PRAS). 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 behaviors, and safeguard the body by enduring the influence of narrow beauty standards promoted in the media. For each item, the following response scale will be used: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, and 5 = Always. 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. Additionally, the internal consistency of the BAS-2 was excellent (Cronbach’s α = 0.954, McDonald’s ω = 0.956).

BES for adolescents and adults is widely utilized to assess cognitive and affective features of body image perception. BES was designed for both men and women young adults and validated among college students. The scale represents distinct dimensions for men and women. 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.

Lastly, another well-accepted body image perception scale measures positive rational acceptance coping. PRAS has been conceptualized and designed as an adaptive affect regulation mechanism when the body is exposed to body image challenges. 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. Participants will be asked to complete an 11-item PRAS of the body image coping strategies inventory (BICSI). Scores on the BICSI have been shown to have adequate factorial and construct validity and internal consistency. Cronbach's $\alpha$ for PRAS scores was 0.85 (95% CI: 0.83 - 0.87).

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 range from 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 1 = never, 2 = , 3 = , to 4 = more than ten times, 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).

Socio-Demographic Variables and Levels of Media Exposure

Based on previous literatures, the socio-demographic 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 (e.g., 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. 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, standard deviation, and range for continuous variables to answer Specific Aim Nos. 1-3. Differences in the socio-demographic characteristics between participants will be assessed using t-tests (for continuous variables) and Chi-square 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 socio-demographic 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 generalized linear models. Depending on how common the mental health outcomes are, generalized 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% confidence interval (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
modeling (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, i.e., with a variance of 1 and a mean of zero. The MLE method estimates parameters and their standard error 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 standardized 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 analyzed using NVivo 1.6.2 software by three research team members independently utilizing the inductive logic approach in thematic analysis: familiarizing with the data, generating initial codes, searching for themes, reviewing the themes, defining and naming the themes, and producing the report.

Data familiarization 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 categorized 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 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 analyzing 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.\textsuperscript{112} \textsuperscript{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 organizing related data in a figure, table, matrix, or graph.\textsuperscript{114-116} Two researchers will be involved in the quantitative and qualitative data triangulation. Should there be disagreements, again the principal investigator together with the multi-disciplinary research team will resolve the issue. Figure 2 shows the study's implementation matrix of the explanatory sequential design.

\textit{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.

\textit{Handling Missing Data}

All responses in the questionnaire using the Qualtrics XM\textsuperscript{TM} 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. Multiple imputations will be used to analyze 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.

**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 (NEGHHRR) 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 upon 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 six (6) months but will be stored for up to three (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.\textsuperscript{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.\textsuperscript{122-125} Reports have also suggested an association between a pattern of better mental health status and using SLPs.\textsuperscript{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.\textsuperscript{19} Many people in some populations are now more likely than ever to lighten their skin to fit into society's definition of beauty.\textsuperscript{128} People who use SLPs feel like they belong in a community where beauty standards must be accepted.\textsuperscript{129} In addition, using SLPs may also be viewed as a coping mechanism for some people.\textsuperscript{69,130,131} 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.\textsuperscript{132}

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,\textsuperscript{100,133-136} or skin-lightening practices,\textsuperscript{137,138} and not the combination. Furthermore, these local studies on body image and mental health mainly tackled body dissatisfaction and depression.\textsuperscript{100,133-136} In contrast, local
studies on skin-lightening practices specifically discussed how colonialism affected how Filipinos think about skin color.\textsuperscript{137,138}

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 to include and promote positive body image perception, safe skin-lightening practices, and mental health status in the current curriculum. Furthermore, the Education Department can 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.

Figure Legends

Figure 1. Structural model for the exposure, mediator, and outcome variables
Figure 2. Implementation Matrix for the proposed explanatory sequential mixed-method study

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. ZGR conceived the study with guidance from ESB. ZGR conceptualized and designed the protocol. ESB, MJL, JPG, and JCM contributed to the introduction, methods and analysis, strengths and limitations, and discussion. All authors reviewed and approved the manuscript.

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Provenance and peer review: Not commissioned; externally peer-reviewed.

REFERENCES


36. Singson F. Colonialism's Role in the Success of the Filipino Skin Whitening Industry. 2017


41. Bettache K. A call to action: The need for a cultural psychological approach to
discrimination on the basis of skin color in Asia. Perspectives on Psychological Science

Standards, and Ethical Engagement Across Three Cultures. Journal of International

43. Glenn EN. Yearning for lightness: Transnational circuits in the marketing and consumption

44. Mahsan IP, Harun MF, Zulkefli MY, et al. Visual communication on social media
advertisement that influence consumer buying behavior on skin-whitening product.

45. Dukut E. Archiving local culture through transnational popular culture research. Innovation

46. Lally J, Samaniego RM, Tully J. Mental health legislation in the Philippines: Philippine

47. Maravilla NMAT, Tan MJT. Philippine Mental Health Act: just an act? A call to look into
the bi-directionality of mental health and economy. Frontiers in Psychology 2021;12

48. Redaniel MT, Lebanon-Dalida MA, Gunnell D. Suicide in the Philippines: time trend


50. Granikov V, Hong QN, Crist E, et al. Mixed methods research in library and information
science: A methodological review. Library & information science research
2020;42(1):101003.


87. Ramesh J. Study on Society's influence on Women's portrayal in the Indian Media with special reference to Advertising and Movies. 2019


132. Santiago-Delefosse M. Psychologie de la santé. *Perspectives qualitatives et cliniques* 2002


Figure 1. Structural model for the exposure, mediator, and outcome variables.

Figure 2. Implementation matrix for the proposed explanatory sequential mixed-method study.
Objectives and Participants

The objective of this study is to gather data and form insights relevant to perceptions of body image and skin lightening practices of emerging Filipino adults. As a first step, an in-depth interview will be conducted to gain knowledge and discover relevant themes and topics.

This study is purposely targeted towards both male or female aged 18-29 years in the Philippines. Specifically, it aims to determine stressors and facilitators among emerging Filipino adults that modified their mental status as influenced by their body image perceptions and skin lightening practices. Salient topics will include current stressors (e.g., personal, social, familial), emotional reactions to these stressors, and facilitators that allow them to modify their body or lighten their skin.

Each interview is expected to run for approximately 30 to 45 minutes.

Logistics

<table>
<thead>
<tr>
<th>Venue</th>
<th>National Capital Region (NCR) / Zoom / Google Meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>October 2022 to February 2023</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>25 informants</td>
</tr>
<tr>
<td>Materials</td>
<td>• Participant profile sheets</td>
</tr>
<tr>
<td></td>
<td>• Guide questions</td>
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<tr>
<td></td>
<td>• Digital or Printed Informed Consent Forms</td>
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<tr>
<td>Supplies</td>
<td>• Laptop</td>
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<tr>
<td></td>
<td>• Digital recorder</td>
</tr>
<tr>
<td></td>
<td>• Sheets of Paper</td>
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<tr>
<td></td>
<td>• Acknowledgment receipts</td>
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<tr>
<td></td>
<td>• Attendance sheet</td>
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<tr>
<td></td>
<td>• Food (if face-to-face)</td>
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</tbody>
</table>
Flow

<table>
<thead>
<tr>
<th>Welcome and Overview</th>
<th>• Introduction of interviewer and interviewee</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 minute)</td>
<td>• Signing of consent forms</td>
</tr>
<tr>
<td>Interview Proper</td>
<td>• Individual responses</td>
</tr>
<tr>
<td>(30-40 minutes)</td>
<td>• Discussion</td>
</tr>
<tr>
<td>Closing</td>
<td>• Wrap-up</td>
</tr>
<tr>
<td>(5 minutes)</td>
<td>• Final notes</td>
</tr>
</tbody>
</table>

Guidelines

1. The participant will be requested to accomplish a profile sheet and to sign the informed consent.
2. The primary researcher shall turn on the digital recorder and record the proceedings of the discussion.
3. The interviewer delivers various questions.
4. The interviewer and interviewee shall discuss the responses and elicit thoughts and opinions.
5. At the end of the interview, the interviewee shall be provided a sheet of paper on which s/he may write down his/her final thoughts, realizations, comments, suggestions, and other notes.

Discussion

<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Image</strong></td>
<td>1. Tell me about what messages you’ve received about the ideal body.</td>
</tr>
<tr>
<td></td>
<td>(Probe for sources of information)</td>
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<tr>
<td></td>
<td>2. Do you think there are different body ideals for different ethnicities or races or not? How do they differ?</td>
</tr>
<tr>
<td></td>
<td>3. Do you think you meet these beauty standards or not? Why do you say so? Would you like to meet them or not? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>4. How do your friends feel regarding meeting these body standards?</td>
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<tr>
<td></td>
<td>-How are body standards met? Are they realistic or not? How does it affect one’s health?</td>
</tr>
<tr>
<td></td>
<td>-Do you feel pressure to meet these body standards or not? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>5. Kindly describe if individuals your age care about how they look like.</td>
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<tr>
<td></td>
<td>-How do individuals your age generally feel about the way they look?</td>
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<tr>
<td></td>
<td>6. What do you think the ideal male/female looks like?</td>
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<td></td>
<td>7. How has the media in general impacted body image?</td>
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<tr>
<td></td>
<td>-When/how are they harmful?</td>
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<tr>
<td></td>
<td>-When/how are they helpful?</td>
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<tr>
<td>Topic</td>
<td>Discussion Questions</td>
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</tr>
</tbody>
</table>
| 8. What type of media influence how you see your body? | - How do these media platforms influence your perception towards body image?  
*Expound on the topic of how television, movies, or specific social media platforms*  
9. Why do you think people want to change their bodies?  
10. Do you compare your appearance to friends/media?  
11. How do you feel about yourself and your body? Why?  
*Expound on why he/she is feeling that way*  
12. What else affects how you see your body? How do these affect body image?  
13. How does your way of seeing your body affect your mental well-being?  
*Expound on how does body image affect his/her mental well-being*  
14. How do you cope with negative feeling towards your body? How do these strategies help you?  
### Skin Lightening  
1. Tell me about what messages you’ve received about the ideal skin tone? (Probe for sources of information)  
- What are these standards? Please describe.  
2. Do you think there are different ideal skin tone for different ethnicities or races? How do they differ?  
3. Do you think you meet these skin tone/color standards or not? Why do you say so? Would you like to meet them or not? Why or why not?  
4. How do your friends feel regarding meeting these standards? Is it hard to meet these standards or not? Are they realistic or not? Why or why not?  
- Do you feel pressure to meet these standards or not? Why or why not?  
5. Kindly describe if individuals your age care about skin tone or skin color.  
- How do individuals your age generally feel about the way they look in terms or skin color?  
6. How has the media in general impacted body image?  
- When/how are they harmful?  
- When/how are they helpful?  
7. What type of media influence your perception towards skin lightening practices?  
8. How do these media platforms influence your perception towards skin tone/color? |
<table>
<thead>
<tr>
<th>Topic</th>
<th>Discussion Questions</th>
</tr>
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<tbody>
<tr>
<td>9.</td>
<td><em>Expound on the topic of how television, movies, or specific social media platforms</em></td>
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<tr>
<td>10.</td>
<td>Why do you think some men or women wish to be whiter/lighter in terms of skin color?</td>
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<tr>
<td>11.</td>
<td>Do you compare your skin tone to friends/media?</td>
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<tr>
<td>12.</td>
<td>Describe the use skin lightening products.</td>
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<td></td>
<td>- What are these products?</td>
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<td></td>
<td>- When did you start using them?</td>
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<td></td>
<td>- How often do you use these products?</td>
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<tr>
<td>13.</td>
<td>Describe the knowledge on the main ingredients of these skin lightening products.</td>
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<tr>
<td></td>
<td>- Why did you choose these certain products?</td>
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<tr>
<td>14.</td>
<td>Do you think skin lightening practices affect how you see your body?</td>
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<tr>
<td></td>
<td>- How and why?</td>
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<tr>
<td>15.</td>
<td>How do you feel about yourself and your skin color/tone? Why?</td>
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<tr>
<td></td>
<td><em>Expound on why he/she is feeling that way</em></td>
</tr>
<tr>
<td>16.</td>
<td>What else affects your perceptions about your skin tone?</td>
</tr>
<tr>
<td></td>
<td>- How do these affect your skin lightening practices?</td>
</tr>
<tr>
<td>17.</td>
<td>How does your skin color/tone affect your mental well-being?</td>
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<td></td>
<td><em>Expound on how does skin tone/color affect his/her mental well-being</em></td>
</tr>
<tr>
<td>18.</td>
<td>Do you do anything to cope with negative feelings towards your skin tone? How do these strategies help you?</td>
</tr>
<tr>
<td>Others</td>
<td>19. Are there things that you would like to add in our discussion that we have not discussed yet? Is there anything that you would like to ask?</td>
</tr>
</tbody>
</table>