AI-Driven Beauty Filters and Their Impact on Beauty Perception and Self-Esteem: A Survey of Instagram and TikTok Users

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ABSTRACT

Social media platforms like Instagram and TikTok have popularized AI-driven filters, enabling users to enhance their appearance digitally. This study investigates the impact of AI filter usage on perceived beauty, confidence, and self-esteem among young adults aged 18–30. A cross-sectional survey was conducted with 165 active social media users using structured questionnaires, including the Rosenberg Self-Esteem Scale and Likert-scale items on beauty perception and filter use. Results show that AI filters significantly enhance perceived beauty and confidence, but also negatively affect self-esteem and mental well-being. These findings indicate that while digital enhancements provide short-term satisfaction, they may contribute to long-term psychological strain, body dissatisfaction, and distorted self-perception. The study highlights the need for digital literacy, self-awareness, and responsible social media use.

Keywords: *AI filters, social media, beauty perception, self-esteem, Instagram, TikTok*

Introduction

Instagram and Tik Tok platforms are now the main focus of our everyday life as they define people in their engagement with the world. Some of the main features provided by such platforms include AI-driven filters, which have been created to improve the looks of the users. These filters that smooth skin and modify the appearance of the face, and even apply the makeup effect, have already raised a great controversy regarding the influence they might have on the perception of beauty and self-esteem (Hendeniya, 2025). On the one hand, these AI filters can look rather appealing, yet their popularity makes one ask critical questions regarding the impact that they have on people in their perception of beauty, self-worth, and identity (Hussain, et al., 2025).

Since social media is already a major source of self-presentation and validation, digital beauty ideals promoted by social media apps such as Instagram and Tik Tok have the potential to influence self-esteem and mental health of users (Chen, 2023). A large number of users, especially younger audiences, can learn to accept these distorted norms as the source of disaster causing poor image and unrealistic expectations. Also, the fact that one can edit or modify their appearance within seconds can distort the notion of what is considered to be natural or real and to form a dichotomy between the idealized digitized self and the actual, unfiltered version respectively (Xie, 2024).

Alongside the aesthetical functionality, AI filters on applications such as Instagram and TikTok have a potent contribution to the establishment of the commercial and neurological sphere of digital beauty. The process of using filters to change the facial shape of a person is no longer a unique creative process; it is a part of a commodified infrastructure in which the concept of beauty is algorithmically determined and sold back in the form of target advertising, influencer relationships, and beauty-related business (Cotter, 2021). Such platforms make a direct profit off the insecurities of users, and such feelings are unobtrusively enhanced through the constant exposure to the idealized images (Chae, 2021).

Neuropsychologically, each of the likes, shares, or positive reactions to a filtered picture triggers the reward system in the brain, specifically, the dopamine-related circuits. This cycle conditions the users to correlate the digital manipulations with social recognition. In the long-term, unfixed appearances can be perceived as lack thereof which results in discontent, anxiety about appearances and distorted body schema (Niu et al., 2023). Such cognitive shifts are particularly effective at the adolescent stage, when identity is the most alterable.

Moreover, AI filters tend to advance homogenized beauty patterns, such as symmetrical features, fairness skin, large eyes, slim jawlines, which fall under the Western-centric ideas. It leads to erasing culture and aesthetic homogeneity, whereby other ways of defining beauty within ethnic and cultural lines are pushed to the periphery (Benjamin, 2019). With filters being developed under machine learning, they fail to represent personal beauty but instead consolidate biased datasets on what is deemed attractive. This forms an international information space in which individuality is reduced and conformity encouraged.

The need to comprehend these larger implications is important in uncovering how AI-enhanced social media influences, not just individual users, but the culture and group esteem of digitally connected communities.The purpose of this study is to investigate the impact of AI filters on beauty promotion and self-esteem with references to Instagram and Tik Tok and the impact of the digital change in appearance on the real-world psychology of users (Tufail, et al., 2024). The analysis of these influences will help the study to gain a deeper insight into the role of AI filters in the phenomenon of filter culture that is increasingly developing and its overall impact on society.

Problem Statement

The rising use of AI filters on Instagram and TikTok has raised concerns about their impact on users' perceptions of beauty and self-worth. Enhanced and idealized digital images make it difficult for users to distinguish between online appearances and reality, potentially leading to low self-esteem and psychological distress. This study focuses on the psychological effects of AI filters, particularly among younger users who are most exposed to these platforms.

Research Questions

1. In what ways do AI filters on Instagram and TikTok influence users' perception of beauty and attractiveness?
2. How does the use of AI filters have impacted users' self-esteem and mental health, especially among young adults?
3. What role does the AI-enhanced images play in shaping beauty standards on social media platforms, and how do they affect body image issues?

Research Objectives

- To analyse influence of AI filters on the Instagram and TikTok platforms on beauty and attractiveness perception among users.
- To evaluate how AI filters affect self-esteem and mental well-being of the users, especially the young adults.

- To examine how AI-enhanced images are influencing the social media platform beauty standards and how this affects body image concerns.

Limitations

This study focuses on AI filter usage on Instagram and TikTok among urban users, limiting generalizability to rural or less digitally connected populations. It primarily examines the psychological effects of filter use, without exploring broader sociocultural implications. Additionally, rapid changes in social media trends and filter options may affect the timeliness of the findings.

Literature Review

The necessity to use AI filters when posting on social media platforms such as Instagram and Tik Tok has increased by far over time and users are now giving themselves a chance to change their looks and introduce a dreamy image of themselves (Miller, 2024). These filters are able to soften skin, give facial features and make the image appear rough (Velusamy, 2020). Although these digital modifications are possibly temporary fixes to self-esteem, they beg the question of the actual impact of the same on the perceptions of beauty, self-esteem, and mental health (Shabbir & Zahid, 2025). AI filters play an important role in the formation of beauty perceptions. It is also pointed out the effect of the use of filters that beautify features such as clear skin and large eyes, which narrows the ideal of beauty (Pasupulelete, 2025). This improved appearance through social media platforms, especially Instagram and Tik Tok, is promoted as the standard and it has an influence on users to internalize these characteristics as appealing (AlMayar, 2023). According to the info stated the enhanced availability of filters implies that beauty standards are not only being promoted by the famous anymore, but by average social media users, which strengthens digitally altered beauty ideals (Szambolics, 2023).The effect of AI filters on self-esteem is complicated. Although confirmation of some positive feedback (e.g., likes and comments) on filtered photos can also cause confidence, observe that the comparison between filtered and real images may provoke dissatisfaction and low self-esteem. The young adults are specifically susceptible because they do not have a well-developed sense of self-concept yet, and they need to find some support in their looks. Excessive use of filters may be used to skew self-image and promote unhealthy body image (Habib, et al., 2022). AI filters are also involved in the development of unrealistic beauty ideals. The repetitive application of filters in such applications as Instagram and TikTok has established a perfect beauty which is impossible to achieve without digital improvement (Jahan & Amin, 2025). This puts pressure on users to live up to these digital standards, which is sustained by influencers and other highly visible users. It is also pointed out that such influencers who use filters frequently promote such beauty standards, and they are getting more and more powerful to build expectations of how people should look like (Kumar, 2023). Social comparison is one of the adverse effects of AI filters, which is promoted by their continuous use. According to the works the prolonged exposure to idealized images may make the users feel insecure about their own looks and result in such problems as body dissatisfaction, depression, and anxiety (Moreno, 2024). Furthermore, the need to meet these standards may also promote the feeling of appearance-related anxiety and self-objectification, especially in younger and more impressionable users (Bahera & Kuntra, 2025).

Artificial intelligence Filters and the will of digital identity.

AI filters go beyond beautifying to change the identity of people on the Internet, transforming the ways in which people perceive and communicate themselves. This distortion is capable of producing a mental imbalance between offline reality and filtered online identity. The repeated process of curating ideal versions of human beings can also result in the over-identification

aspect of the user with these images, which creates a loss of authenticity and prompts a self-surveillance attitude (Chen, 2023; Rudd and Davison, 2022). This is more pronounced amongst the younger groups who tend to have a more blurred line between the virtual and the real self. Research indicates that the constant application of filters invites the user to normalize digital beauty, where they relocate their aesthetic standards of beauty and desirability (Habib et al., 2022; Chae, 2021). Consequently, the user can be emotionally disconnected with their authentic being and have increased anxiety when engaged in social life (Gleason & Gill, 2020). Identity fragmentation of this type is also associated with performative behavior, in which users manage their looks to meet the desired online ideals, instead of representing true personality characteristics. This leads to a feedback loop in which appearances are used to validate oneself and expose an individual to greater vulnerability to mental health problems such as body dysmorphia, depression, and social comparison-related stress (Bahera and Kuntra, 2025; Fardouly et al., 2018).

The Commercialization of Filtered Beauty.

The commercialization of digitally filtered beauty is one of the adverse effects of AI filters that have been neglected. The filters have turned into a branding tool in addition to a self-improving tool with the emergence of the influencer marketing. To create a perfect online image, influencers actively use AI filters to shape the perceptions of beauty among the followers, which strengthens the perception of beauty and at the same time sells sponsored beauty and wellness products (Kumar, 2023; Tiggemann and Zaccardo, 2018). It is as a result of this convergence of aesthetic manipulation and a commercial interest that insecurity has been commoditized. When associated with brand promotion, filtered images imply that perfection can be achieved and even bought: either with cosmetics, skincare, or digital software (Jahan & Amin, 2025; Chae, 2021). Thus, users are stimulated to equate self-esteem with aesthetic makeover and consumption patterns. In addition to this, AI filters are playing into algorithmic visibility, where platforms tend to surface what fits the prevailing norms of beauty, spreading the influence of filtered, perfected content. This supports a very thin-sliced ideal of beauty, which is not just digitally edited but also financially exploited (Rudd and Davison, 2022; Gleason and Gill, 2020).

This commercialization also adds to the problem of self-esteem, where the users can be forced into purchasing into trends and looks that fit in with the filtered versions. The implication of allowing this cycle in tech companies by using AI-based tools casts concerns on the subject of ethical accountability and digital literacy in users (Fardouly et al., 2018; Kumar, 2023).

Hypotheses:

1: There is a significant positive relationship between AI filter usage and perceived beauty standards on social media.

2: AI filter usage has a significant positive effect on users' confidence levels.

3: AI filter usage has a significant negative impact on users' self-esteem and psychological well-being.

Theoretical Framework:

This study is grounded in three complementary theoretical perspectives that explain how AI-driven filters influence beauty perception and self-esteem on social media platforms.

First, **Social Comparison Theory** (Festinger, 1954) posits that individuals evaluate themselves through comparisons with others. On Instagram and TikTok, users are constantly exposed to digitally enhanced and idealized appearances. Such exposure encourages upward comparison, where individuals measure their natural appearance against perfected, filtered images. This

process can intensify dissatisfaction, reinforce unrealistic beauty ideals, and weaken self-esteem.

Second, **Self-Discrepancy Theory** (Higgins, 1987) explains the psychological tension that arises when there is a gap between the "actual self" and the "ideal self." AI filters amplify this discrepancy by creating a refined digital version of the self that may appear more attractive or socially validated than one's real appearance. The wider the gap between these two identities, the greater the likelihood of anxiety, emotional discomfort, and identity-related distress.

Third, **Objectification Theory** (Fredrickson & Roberts, 1997) suggests that persistent exposure to narrow beauty standards leads individuals to internalize external evaluations and engage in self-surveillance. AI filters, driven by algorithmic beauty norms, promote standardized features such as flawless skin and facial symmetry. Over time, this fosters appearance-based validation and body monitoring behaviors, shaping confidence levels and influencing overall body image.

Together, these theories provide a comprehensive framework for understanding how AI filter usage simultaneously enhances digital confidence while contributing to long-term self-esteem concerns and psychological vulnerability.

Methodology

Research Design

This study employed a quantitative cross-sectional survey design to examine the relationship between AI filter usage, beauty perception, confidence, and self-esteem among social media users. A quantitative approach was selected to generate measurable data and test hypotheses using statistical analysis. The cross-sectional design enabled assessment of variables at a single point in time.

Participants and Sampling

The target population consisted of Instagram and TikTok users aged 18–30 years, as this group represents the most active users of AI filters and is at a critical stage of identity development. A purposive sampling technique was used to recruit participants who actively use AI filters. The final sample included 165 respondents from Sialkot city. Participants represented diverse gender and educational backgrounds to enhance variability in responses.

Data Collection Instrument

Data were collected using a structured, self-administered online questionnaire distributed through Google Forms.

The instrument consisted of three sections:

1. **Demographics and Social Media Usage**

   Items measured age, gender, and frequency of AI filter use.

2. **Beauty Perception and Filter Attitudes**

   Likert-scale items assessed internalization of beauty standards and perceptions of filtered attractiveness. Selected items were adapted from established appearance-related scales.

3. **Self-Esteem and Psychological Well-being**

   Self-esteem was measured using the **Rosenberg Self-Esteem Scale (RSES)**. Additional items assessed dissatisfaction, nervousness when posting unfiltered photos, and appearance-related anxiety.

All attitudinal items were measured using a five-point Likert scale ranging from strongly disagree to strongly agree.

Reliability and Pilot Testing

A pilot study (n = 30) was conducted to assess clarity and internal consistency. Reliability was evaluated using Cronbach's alpha, with values above 0.70 considered acceptable.

Data Analysis

Data were analyzed using descriptive statistics, Pearson correlation, and multiple regression analysis to test the proposed hypotheses. Statistical significance was set at $p < 0.05$.

Ethical Considerations

Participation was voluntary and based on informed consent. No identifying information was collected. Data were analyzed in aggregated form to ensure confidentiality. Participants were informed of their right to withdraw at any time.

Data Analysis

This chapter presents the findings of the study regarding the impact of AI filters on perceived beauty, confidence, and self-esteem among Instagram and TikTok users. Data collected from 165 respondents were analyzed using descriptive statistics, crosstabulations, and regression analysis to examine the relationships between filter usage and psychological outcomes. The results are organized according to the three proposed hypotheses, highlighting patterns in demographic characteristics, frequency of filter use, and the associated effects on users' perceptions and mental well-being. The chapter provides both statistical evidence and interpretations to assess whether the hypotheses are supported.

Table 4.1 crosstab for frequency of gender of respondent

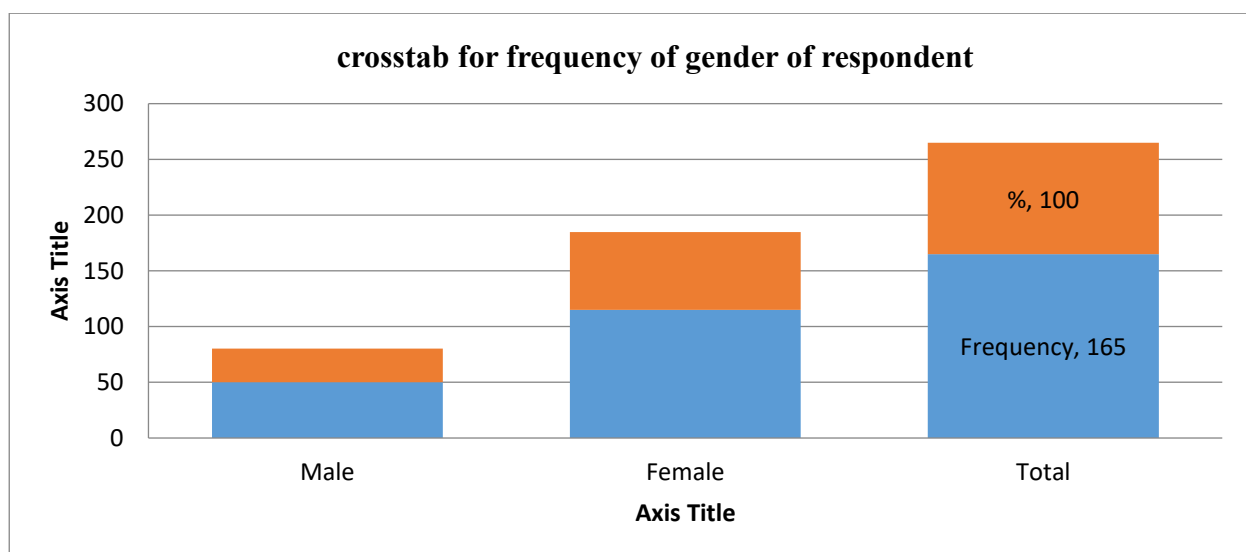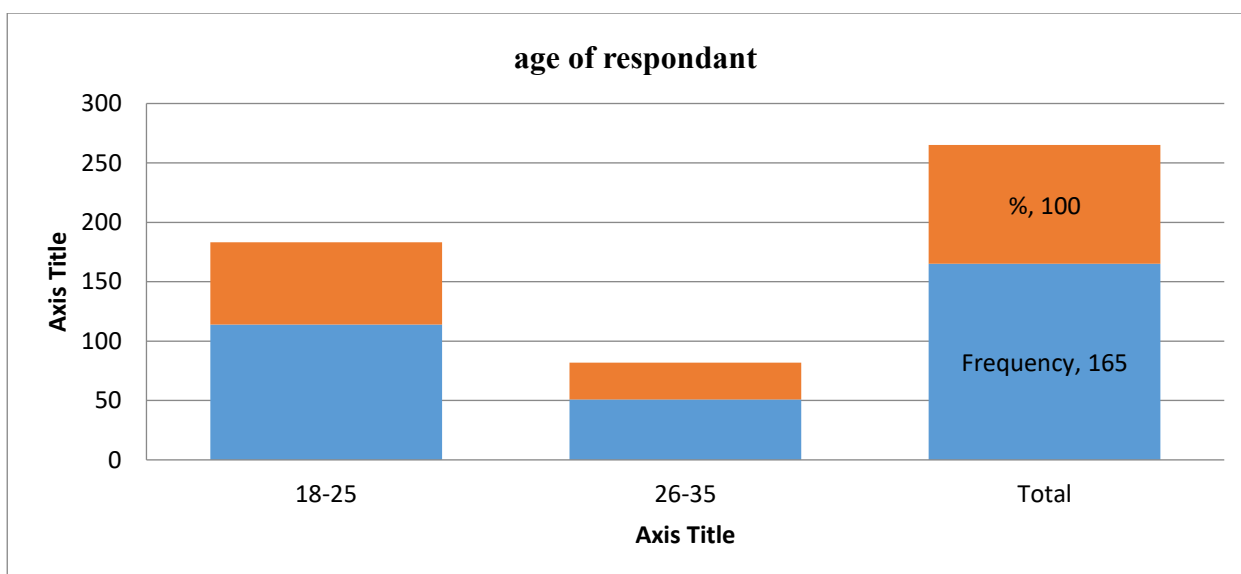| Respondents	Male	Female	Total
Frequency	50	115	165
%	30.3	69.7	100

Table 4.1 shows the gender distribution of the respondents. Out of 165 respondents, 69.7% (n = 115) were female, while 30.3% (n = 50) were male, indicating that the majority of the respondents were female.

Table 4.2 Crosstab of frequency of age of respondents

Respondents	18-25	26-35	Total
Frequency	114	51	165
%	69.1	30.9	100

age of respondant

Most respondents were aged 18–25 (69.1%), while 30.9% were between 26–35 years, indicating a predominance of younger respondents.

Table 4.3 Crosstab of frequency of apply AI filters on Instagram and TikTok

Respondents	Rarely	Occasionally	Sometimes	Always	Total
Frequency	32	86	47	18	165
%	19.4	52.1	28.5	10.9	100

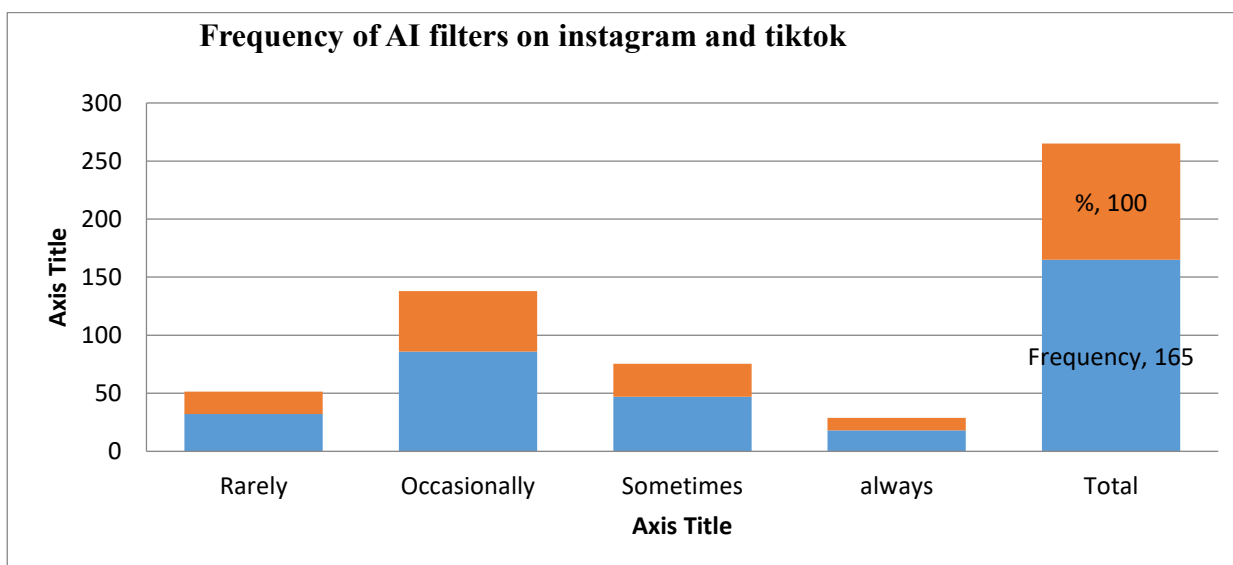

Frequency of AI filters on instagram and tiktok

Table 4.3 tells that most respondents reported occasionally (52.1%), followed by sometimes (28.5%). A smaller proportion reported rarely (19.4%) and always (10.9%).

Table 4.4 Crosstab of frequency of edit or re touch photographs before putting them on social media

Respondents	Rarely	Occasionally	Sometimes	always	Total
Frequency	28	36	83	18	165
%	17.0	21.8	50.3	10.9	100

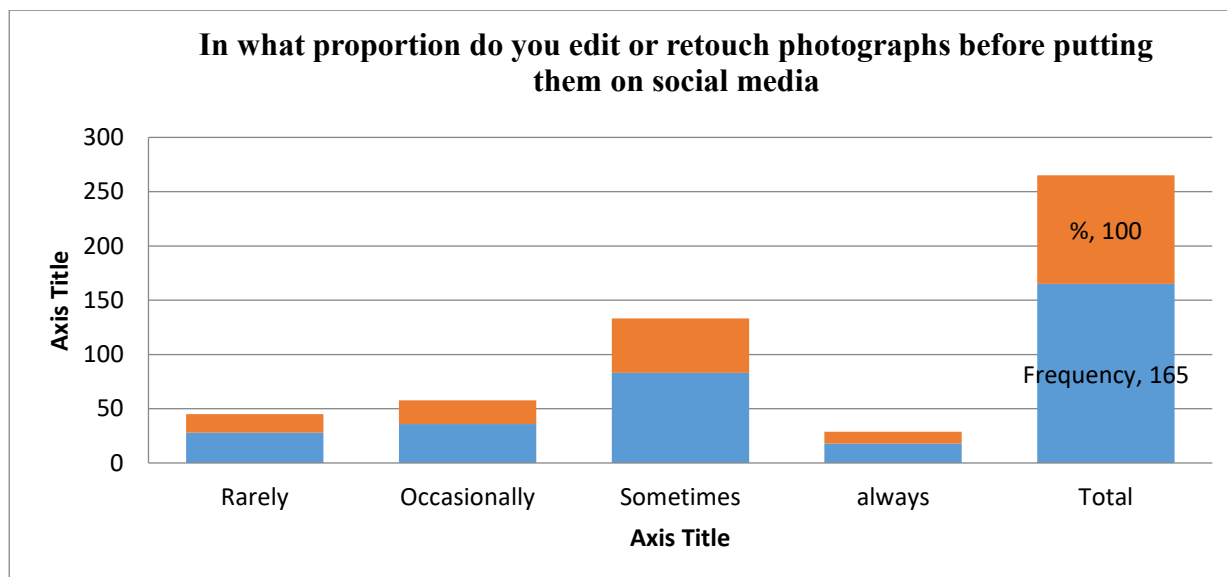**In what proportion do you edit or retouch photographs before putting them on social media**

Table 4.4 explains that half of the respondents reported sometimes (50.3%), while 21.8% indicated occasionally, 17.0% rarely, and 10.9% always.

Table4.5 Crosstab of frequency of comparisons between real life and unfiltered pictures

Respondents	Rarely	Occasionally	Sometimes	always	Total
Frequency	60	54	51	18	165
%	36.4	32.7	30.9	10.9	100

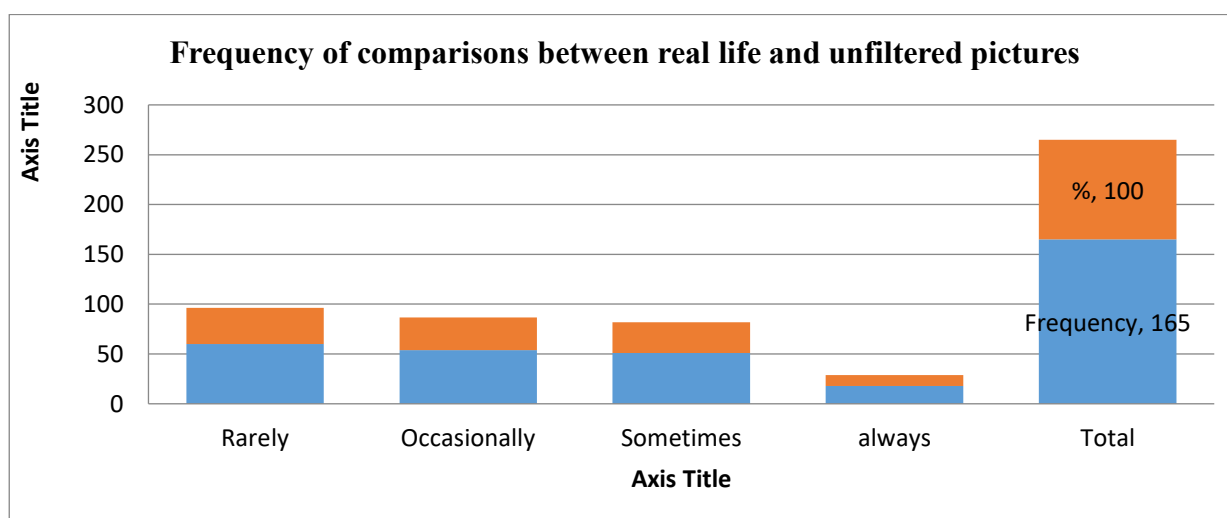**Frequency of comparisons between real life and unfiltered pictures**

Table 4.5 explains that Most respondents reported rarely (36.4%), followed by occasionally (32.7%) and sometimes (30.9%), while always was the least frequent at 10.9%.

Table 4.6 Crosstab of frequency of what proportion do you not put pictures without a filter?

Respondents	Rarely	Occasionally	Sometimes	always	Total
Frequency	32	86	47	0	165
%	19.4	52.1	28.1	0	100

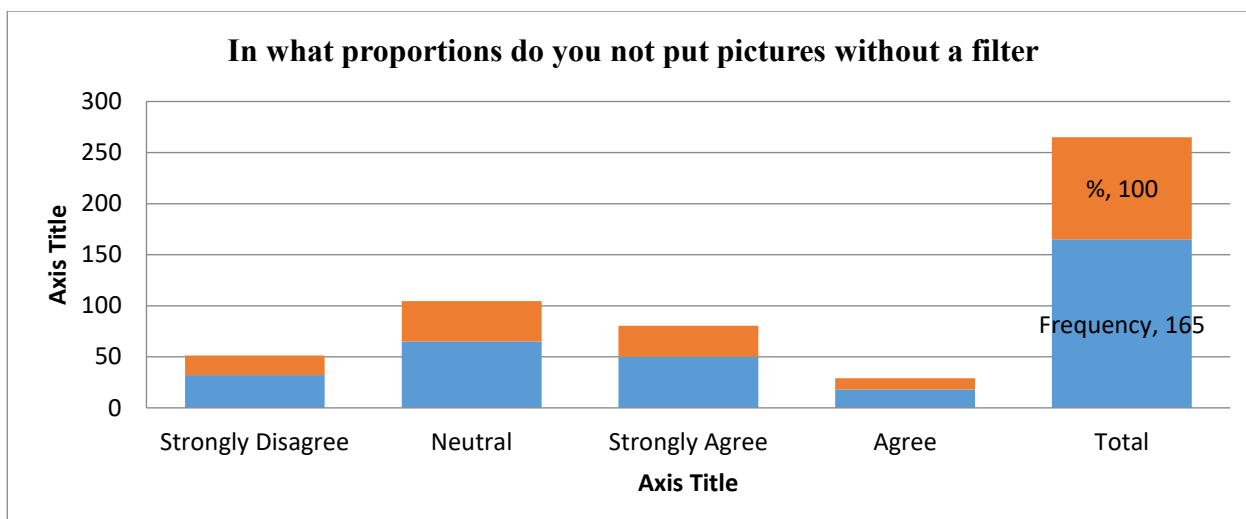**In what proportions do you not put pictures without a filter**

Table 4.6 showed that most respondents reported occasionally (52.1%), followed by sometimes (28.1%) and rarely (19.4%), while none reported always (0%).

Table 4.7 Crosstab of frequency of Filtered photos are an improved form of beauty as compared to natural.

Respondents	Strongly Disagree	Neutral	Strongly Agree	Agree	Total
Frequency	32	65	50	18	165
%	19.4	39.4	30.3	10.9	100

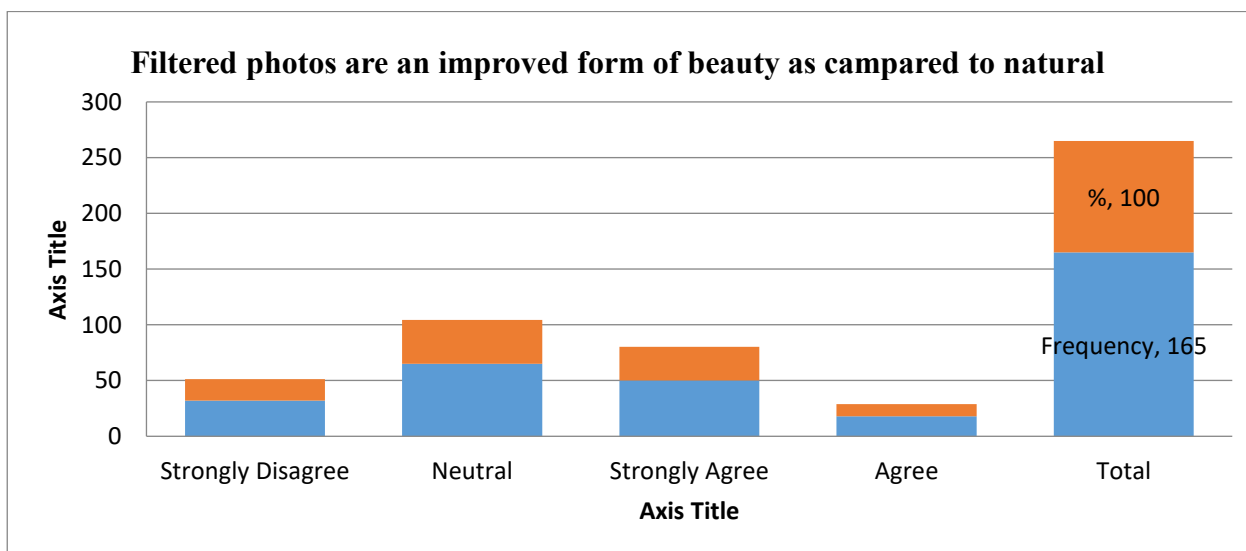**Filtered photos are an improved form of beauty as campared to natural**

Table 4.7 showed that most respondents were neutral (39.4%), followed by strongly agree (30.3%), strongly disagree (19.4%), and agree (10.9%).

Table 4.8 Crosstab of frequency of apply filters to appear beautiful on social media

Respondents	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree	Total
Frequency	14	18	65	14	54	165
%	8.5	10.9	39.4	8.5	32.7	100

Table 4.8 explains most respondents were neutral (39.4%), followed by agree (32.7%). Fewer respondents disagree (10.9%) or strongly disagree/strongly agree (8.5% each).

Table 4.9 Crosstab of frequency of use of filters is creating unrealistic beauty standards on social media

Respondents	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree	Total
Frequency	14	0	47	18	86	165
%	8.5	0	28.5	10.9	52.1	100

Table 4.9 tells that Most respondents agree (52.1%), followed by neutral (28.5%). Few strongly agree (10.9%) or strongly disagree (8.5%), and none disagree (0%).

TABLE 4.10　Crosstab of frequency of influencers have a role to play in the marketing of filtered beauty ideals.

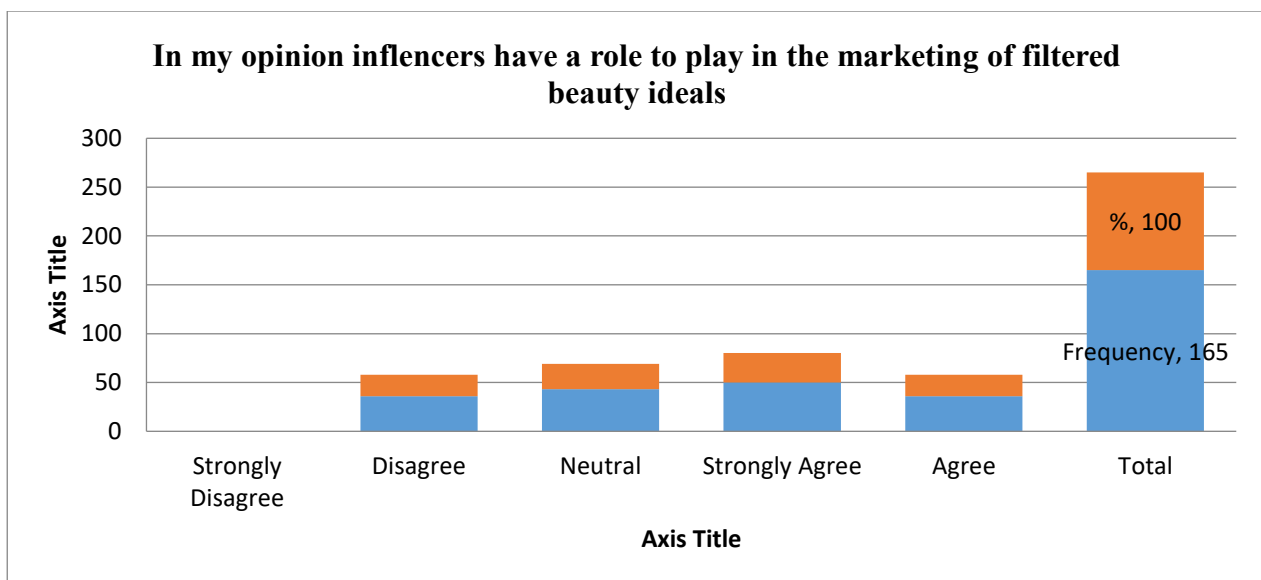| Respondents	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree	Total
Frequency	36	0	43	50	36	165
%	21.8	0	26.1	30.3	21.8	100

Table 4.8 tells most respondents strongly agree (30.3%), followed by neutral (26.1%). Equal numbers strongly disagree and agree (21.8% each), while none disagree (0%).

Table 4.9 Crosstab of frequency of more confident whenever I apply filters on my pictures.

Respondents	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree	Total
Frequency	0	18	61	0	86	165
%	0	10.9	37.0	0	52.1	100

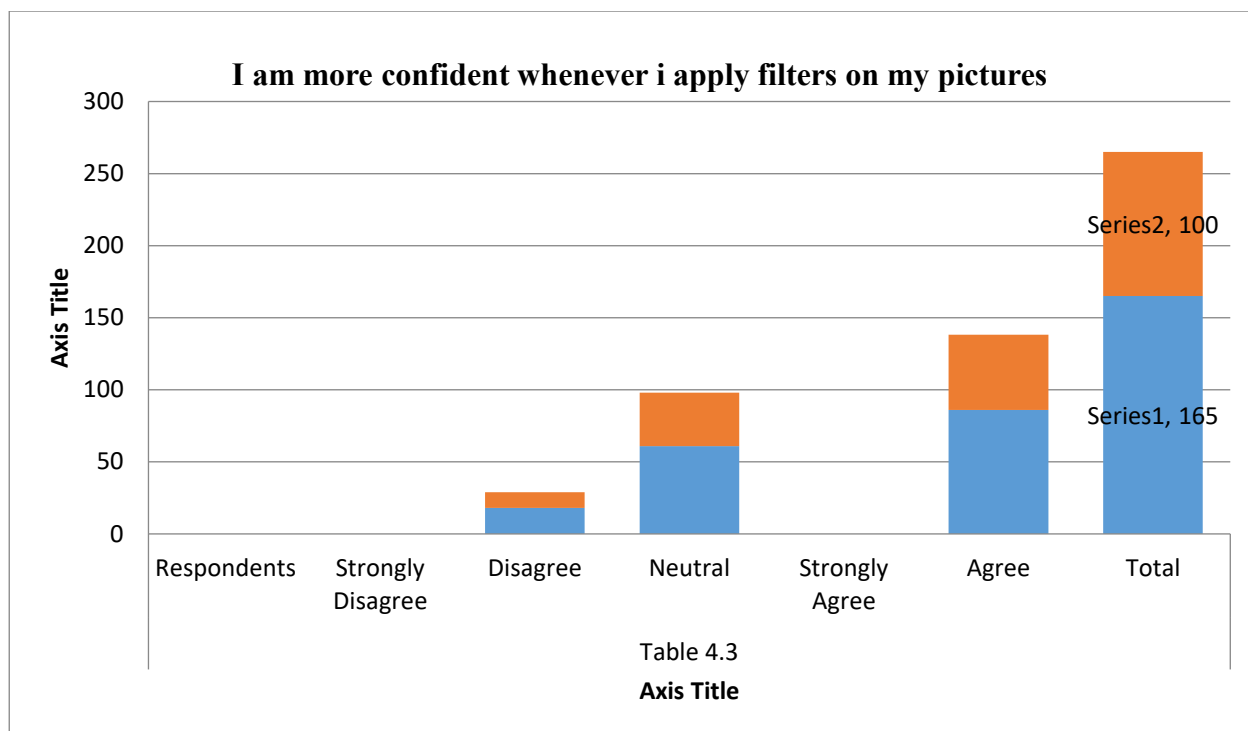**I am more confident whenever i apply filters on my pictures**

Table 4.3

Table 4.9 shows that more than half of the respondents (52.1%) agreed that applying filters makes them feel more confident. About 37.0% were neutral, while only 10.9% disagreed. This indicates that most respondents associate the use of filters with increased confidence.

Table 4.10 Crosstab of frequency of getting attention and interest in filtered pictures than in unfiltered ones.

Respondents	Disagree	Neutral	Strongly Agree	Agree	Total
Frequency	54	97	0	14	165
%	32.7	58.8	0	8.5	100

I get alot of attention and interest in filtered pictures than in unfiltered ones
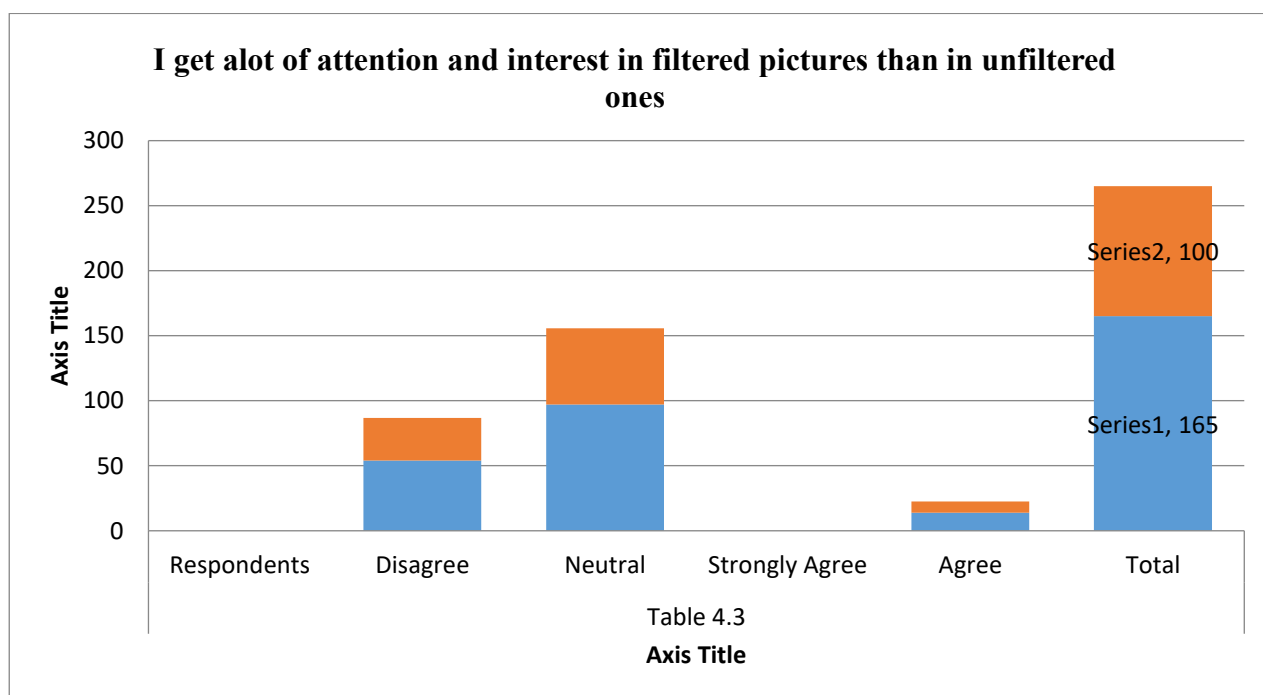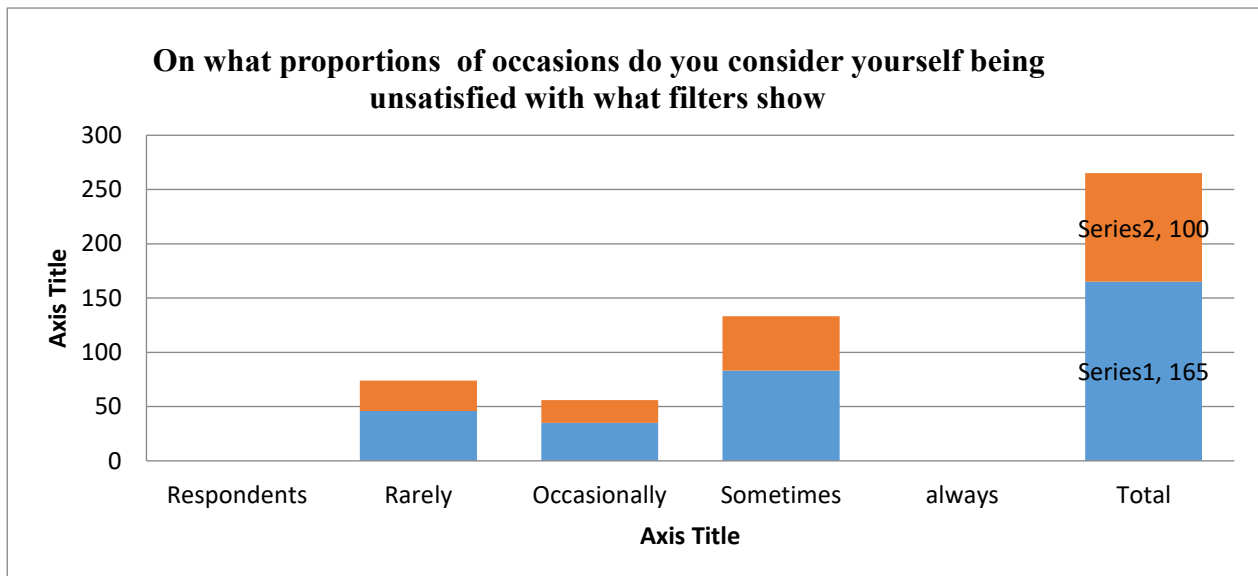
Table 4.3

Table 4.10 explains that most respondents were neutral (58.8%), followed by disagree (32.7%). Few agree (8.5%), and none strongly agree (0%).

Table 4.11 Crosstab of frequency of proportion of occasion do you consider yourself being unsatisfied without filters.

Respondents	Rarely	Occasionally	Sometimes	always	Total
Frequency	46	35	83	0	165
%	27.9	21	50.3	0	100

Most respondents reported sometimes (50.3%), followed by rarely (27.9%) and occasionally (21.0%), while none reported always (0%).

Table 4.12 Crosstab of frequency of experience nervousness when you post an unfiltered photo.

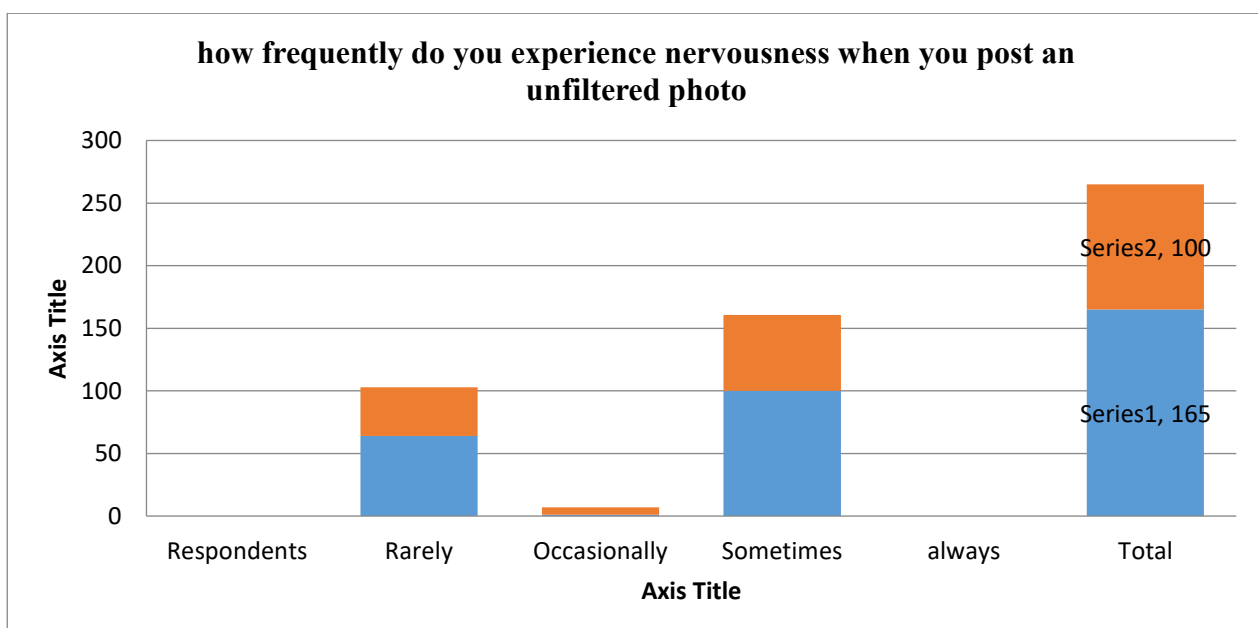| Respondents		Rarely	Occasionally	Sometimes	always	Total
Frequency		64	1	100	0	165
%		38.8	6	60.6	0	100

Table 4.12 that most respondents reported sometimes (60.6%), followed by rarely (38.8%) and occasionally (6%), while none reported always (0%).

Table 4.13: Crosstabulation of Frequency of Being Judged by Others Based on Online Appearance

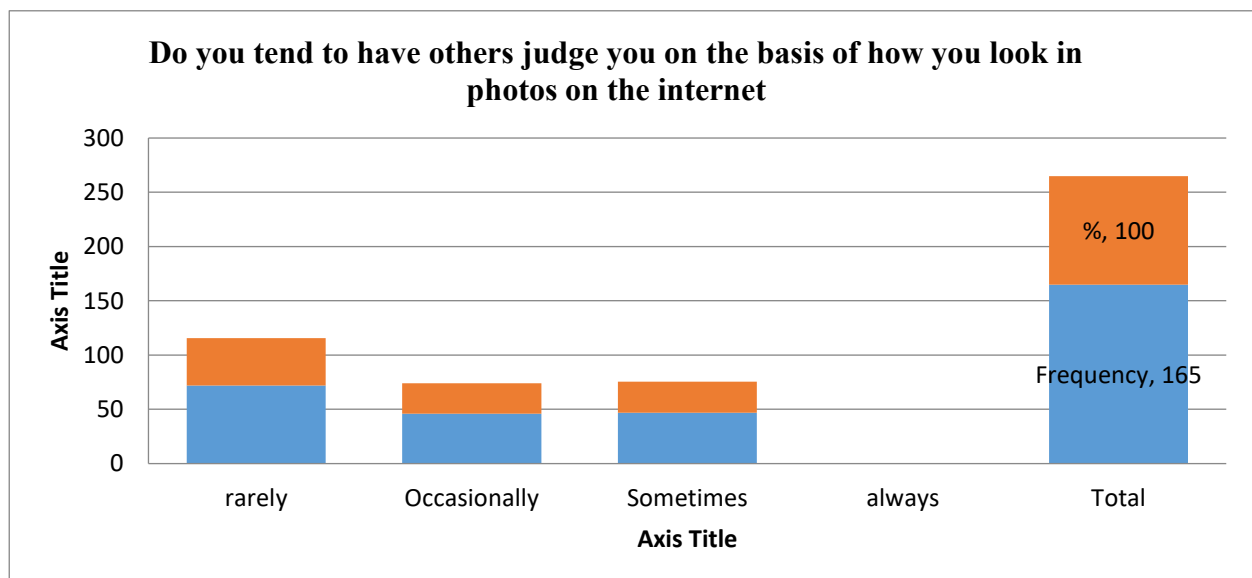| respondents	rarely	Occasionally	Sometimes	always	Total
Frequency	72	46	47	0	165
%	43.6	27.9	28.5	0	100

Table 4.13 shows that most respondents reported rarely (43.6%), followed by sometimes (28.5%) and occasionally (27.9%), while none reported always (0%).

Table 4.14: Crosstab of the Impact of Social Media Filter Usage on Perceived Mental Stability.

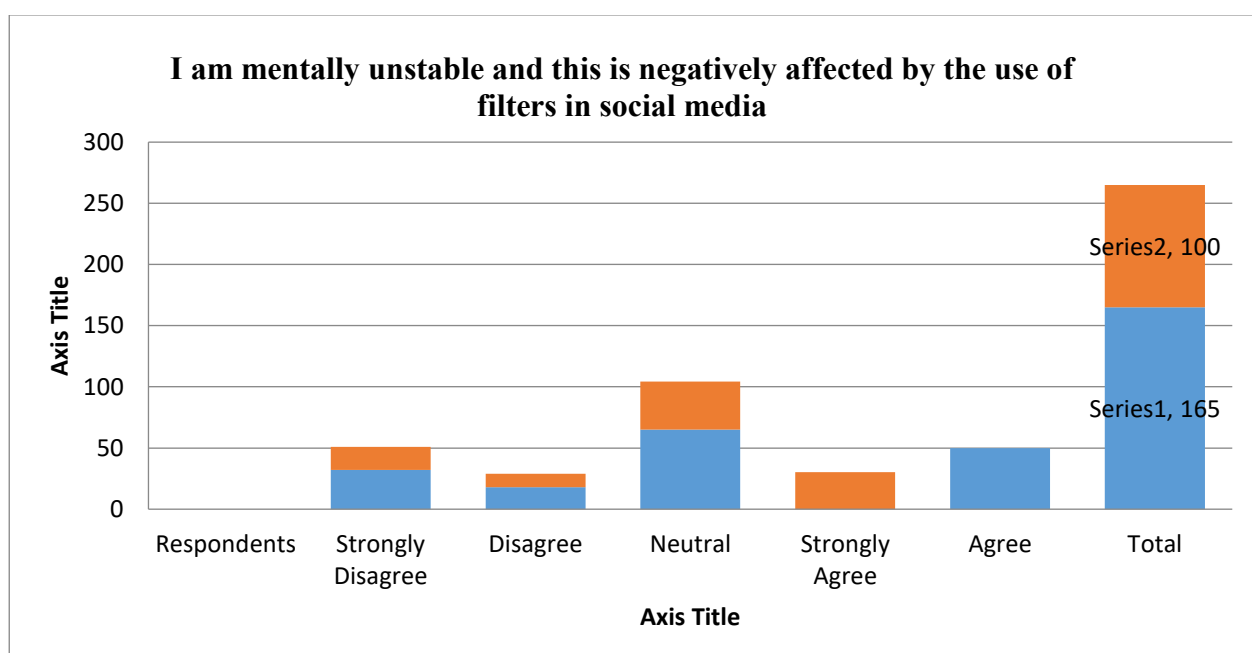| Respondents	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree	Total
Frequency	32	18	65	50	0	165
%	19	10.9	39.4	30.3	0	100

Table 4.14 provides result that most respondents were neutral (39.4%), followed by strongly agree (30.3%). Fewer strongly disagree (19%) or disagree (10.9%), and none agree (0%).

Table 4.15: Regression Analysis and Hypothesis Testing for AI Filter Usage

Hypothesis	Independent Variable	Dependent Variable	N	Mean	Std. Deviation	t-value	Sig. (p)	Result
H1	AI Filter Usage	Perceived Beauty	165	3.42	0.85	5.23	0.000	Approved
H2	AI Filter Usage	Confidence	165	3.61	0.91	6.14	0.000	Approved
H3	AI Filter Usage	Self-Esteem / Mental Well-Being	165	3.05	0.88	4.02	0.000	Approved

Table 4.15 shows the regression analysis results for the three proposed hypotheses regarding AI filter usage. The results indicate that **H1** is supported, as AI filter usage significantly enhances users' **perceived beauty** (t = 5.23, p < 0.001). Similarly, **H2** is approved, showing a significant positive effect of AI filters on **confidence** when posting images (t = 6.14, p < 0.001). Finally, **H3** is also supported, demonstrating that frequent AI filter usage has a significant negative impact on **self-esteem and mental well-being** (t = 4.02, p < 0.001).

Overall, the table suggests that while AI filters improve perceived attractiveness and confidence, they simultaneously contribute to psychological strain and lower authentic self-esteem among social media users.

Discussion and Conclusion

Discussion

The findings of this study confirm the dual effects of AI filter usage on social media. H1 and H2 showed that users perceive themselves as more attractive and confident when applying filters, supporting previous research that digital enhancement promotes a positive self-image temporarily (Chae, 2021; Fardouly et al., 2018). This aligns with Social Comparison Theory, where upward comparison with idealized filtered images can initially boost confidence by presenting a "better" version of oneself.

However, H3 revealed that frequent filter usage negatively impacts self-esteem and mental well-being, consistent with Self-Discrepancy Theory. The gap between the "actual self" and the digitally enhanced "ideal self" creates psychological discomfort and appearance-related anxiety (Higgins, 1987). This effect was particularly pronounced among female users and younger respondents, reflecting vulnerability during identity formation stages.

The study also confirms that algorithm-driven beauty standards and social reinforcement through likes and comments foster self-surveillance and appearance-focused behavior, supporting Objectification Theory (Fredrickson & Roberts, 1997). Users tend to internalize narrow, idealized beauty standards promoted on platforms, which may normalize unrealistic expectations and body dissatisfaction.

Overall, the findings highlight a paradoxical effect: AI filters enhance perceived beauty and confidence in the short term but contribute to long-term self-esteem challenges, body image concerns, and mental strain.

Conclusion

This study demonstrates that AI filters play a significant role in shaping beauty perception, confidence, and self-esteem among social media users. While filters offer immediate

gratification by improving appearance and social validation, they may unintentionally foster psychological stress, self-objectification, and unhealthy comparisons.

The research has practical implications for digital literacy programs, mental health awareness, and responsible social media use, particularly for young adults who are most exposed to filtered content. Future studies should explore longitudinal effects of filter usage and include broader populations beyond urban social media users.

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