

## Article

# Evaluating the Impact of Oil Refinery on Landscape Values Perception and Mental Health: A Case Study of Tehran

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**Abstract:** In today's society, stress is recognized as a major contributor to illness. It can be reduced through exercise, which lowers stress hormones, and exposure to daylight, which regulates hormones such as cortisol and melatonin. Furthermore, the design and perception of the environment can indicate danger or safety, influencing stress levels and mental health. This study examines the Tehran Oil Refinery's impact on local residents' perceptions of landscape values and mental health. Oil refineries, which use compounds derived from natural gas or crude oil, pose both short- and long-term environmental and health risks. Using a Geographic Information System for Public Participation (PPGIS), the study investigates how the industrial landscape surrounding the Tehran Oil Refinery influences residents' emotional responses and stress levels. The study collects sociodemographic data, self-perceived health data, and landscape valuations before and after photography interventions. The findings indicate a complex relationship between the refinery's presence and perceptions of landscape values. Manipulated photographs used in the study show how visual elements can influence emotional responses, highlighting a direct link between stress and environmental perception. This case study adds to larger discussions about the effects of industrialization on public mental health and the environment, emphasizing the importance of incorporating public perception into urban planning in order to achieve sustainable development.



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**Keywords:** participatory process; industrial clusters; landscape perception; stress

## 1. Introduction

Today, stress is regarded as one of the most critical factors related to ill health in modern society. Stress reactions may be reduced with exercise, which rids the body of some of the fighting and wakefulness hormones. Exposure to daylight may reduce stress reactions by adjusting hormone levels, especially cortisol and melatonin. Moreover, the environment's design may signal danger or safety [1].

Understanding the relationship between the urban environment and health, particularly the benefits of the outdoors for mental health, is becoming increasingly important [2–4]. This is why urban planners and architects must consider the built environment's impact on stress levels. By incorporating landscape values such as green spaces, natural light, and opportunities for physical activity, they can help create environments that promote relaxation and well-being. According to Ulrich et al. (1991), different conceptual perspectives suggest that natural environments reduce stress and promote recovery, while urban environments hinder recuperation. The psycho-evolutionary theory posits that these restorative effects

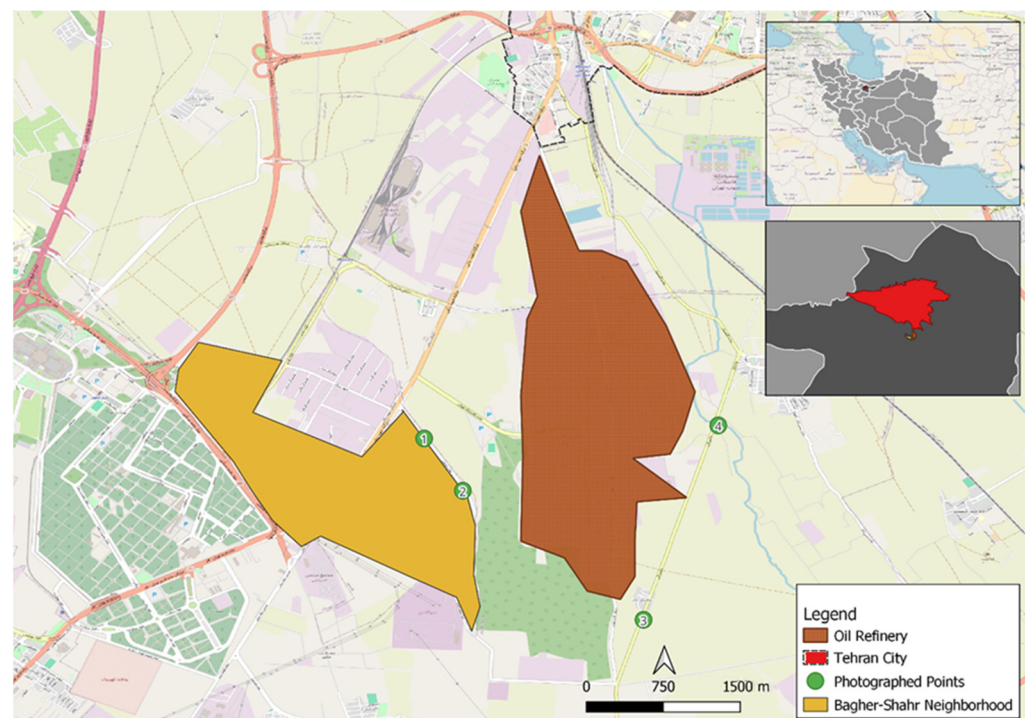
involve positive shifts in emotional states, physiological changes, and sustained attention. Their research found that individuals exposed to natural settings after a stressful stimulus experienced faster recovery, as indicated by physiological and self-reported measures, than those exposed to urban environments. This supports the notion that the characteristics of an environment—such as the presence of nature versus human-made elements—play a crucial role in influencing stress recovery and mental well-being [5].

Several studies have focused on landscape values and stress. Grahn and Stigsdotter [1] investigated how city landscape planning could affect residents' health. They found statistically significant associations between using urban open green spaces and self-reported stress experiences regardless of the informant's age, gender, or socioeconomic status. The study found that the more often a person visits urban open green spaces, the less likely he or she is to report stress-related illnesses. Skärbäck [6] explored the balance between nature and landscape values in development planning, focusing on measures to mitigate negative impacts. This research aimed to raise awareness among the public, developers, and politicians about improving health as a parameter for sustainable development. Thompson et al. [7] discovered that salivary cortisol can be used as a biomarker to assess stress levels associated with green space exposure. Their research discovered significant links between self-reported stress, cortisol secretion patterns, and green space quantity in the living environment. The percentage of green space in the living environment significantly predicted the circadian cortisol cycle and self-reported physical activity. Van den Berg et al. [8] explored the potential of green space to mitigate the negative health effects of stressful life events. They found that respondents with more green space were less affected by stressful life events. Stigsdotter et al. [9] investigated the associations between green space and health, health-related quality of life, and stress, respectively. They found that respondents living one kilometer away from green spaces report poorer health and quality of life and have 1.42 times more chances of experiencing stress compared to those living closer. Grahn and Stigsdotter [10] found a relationship between sensory perception of natural environments and human health. They identified eight perceived sensory dimensions: Serene, Space, Nature, Rich in Species, Refuge, Culture, Prospect, and Social. People prefer Serene, followed by Space, Nature, Rich in Species, Refuge, Culture, Prospect, and Social. Refuge and nature were found to be most strongly correlated with stress, suggesting the need for restorative environments. This indicates that individuals often seek these environments for stress relief, highlighting their importance as restorative spaces. Lottrup, Grahn, and Stigsdotter [11] investigated the relationship between access to green outdoor environments at work and employees' perceived stress and attitude toward the workplace. Data showed a significant relationship between physical and visual access to greenery, a positive workplace attitude and decreased stress for male respondents. Female respondents showed a similar relationship but not between access and stress. Vujcic et al. [12] found that green spaces are suitable settings for running and jogging, and they may alleviate self-reported nervous problems and medication use. Shu et al. [13] investigated the restorative effects of virtual nature on anxiety, depression, and stress in patients with depression. It found that landscape type, viewing distance, and permeability significantly influence these effects. Studies showed that environments with higher openness, green elements, blue sky, and sunshine exposure had higher restorative levels. Grassland landscapes with higher viewing distances showed more restorative impacts. Ha et al. [14] investigated the relationship between urban green space and mental health in Chicago, focusing on the spatial distribution of green spaces. They found that residents reported less psychological distress in urban landscapes with small-sized water bodies and greater distances between forested areas. However, psychological distress levels were lower in landscapes with a

disaggregated distribution of green spaces, suggesting that the configuration of urban green space may be as important as the amount of green space.

### 1.1. Explaining Case Study

The Tehran Oil Refinery (Figure 1), located south of Tehran, is one of Iran's most important oil-producing facilities. It was built between 1965 and 1968, with the south refinery becoming operational in 1969 and the north refinery in 1973. The refinery is still fully operational today, playing an important role in the country's oil production. The refinery produces many petroleum and chemical products, including liquid gas, regular gasoline, light and heavy naphtha, kerosene, gas oil, furnace oil, and mineral oil. The Tehran refinery produces 11% gasoline, 34% gas oil, 21% furnace oil, and 2% other products, accounting for approximately 12% of Iran's total refining capacity [15]. Air pollution is a primary environmental concern at this refinery because it emits particulate matter, volatile organic compounds, NO<sub>x</sub>, SO<sub>x</sub>, and other harmful pollutants that endanger both human health and the environment.



**Figure 1.** Case study Location and surroundings.

### 1.2. Problem Statement

Industrial areas, particularly petrochemical plants and oil refineries, pose significant environmental and social challenges to nearby populations, including both short- and long-term risks to public health and the environment. However, the extent to which these industrial presences affect local residents' emotional and psychological well-being remains underexplored. This study aims to address this gap by using an online participatory survey combined with a Public Participation Geographic Information System (PPGIS) to investigate how residents perceive landscape values in areas near the Tehran Oil Refinery and surrounding industrial complexes. The primary objectives of the study are outlined below:

- To assess the perception of landscape values near the Tehran Oil Refinery.
- To examine the relationship between landscape value perceptions and stress levels among local residents.

By exploring how oil refineries influence perceptions of landscape values in Tehran, this study seeks to offer policymakers and stakeholders critical insights into industrial clusters' strategic planning and design, ultimately aiming to mitigate their adverse impacts on human health.

## 2. Materials and Methods

The term PPGIS was first used in 1996 at the National Center for Geographic Information and Analysis meetings in the United States, and its relevance has been emphasized repeatedly [16]. There are various methods for analyzing landscape values and stress levels. For example, one of the most recent participatory methods is public participation geographic information (PPGIS), which is a system used in various landscape value studies [17–21]. In addition, participatory methods were used in various stress and well-being studies on an urban scale [22,23]. This study integrates PPGIS by combining geographic data with public perceptions of landscape values and mental health. The methodology includes the spatial mapping of respondents' perceptions using a participatory survey design incorporating geolocated data points. These data are analyzed in relation to the proximity to the Tehran Oil Refinery, thus grounding the study in a spatial and participatory framework.

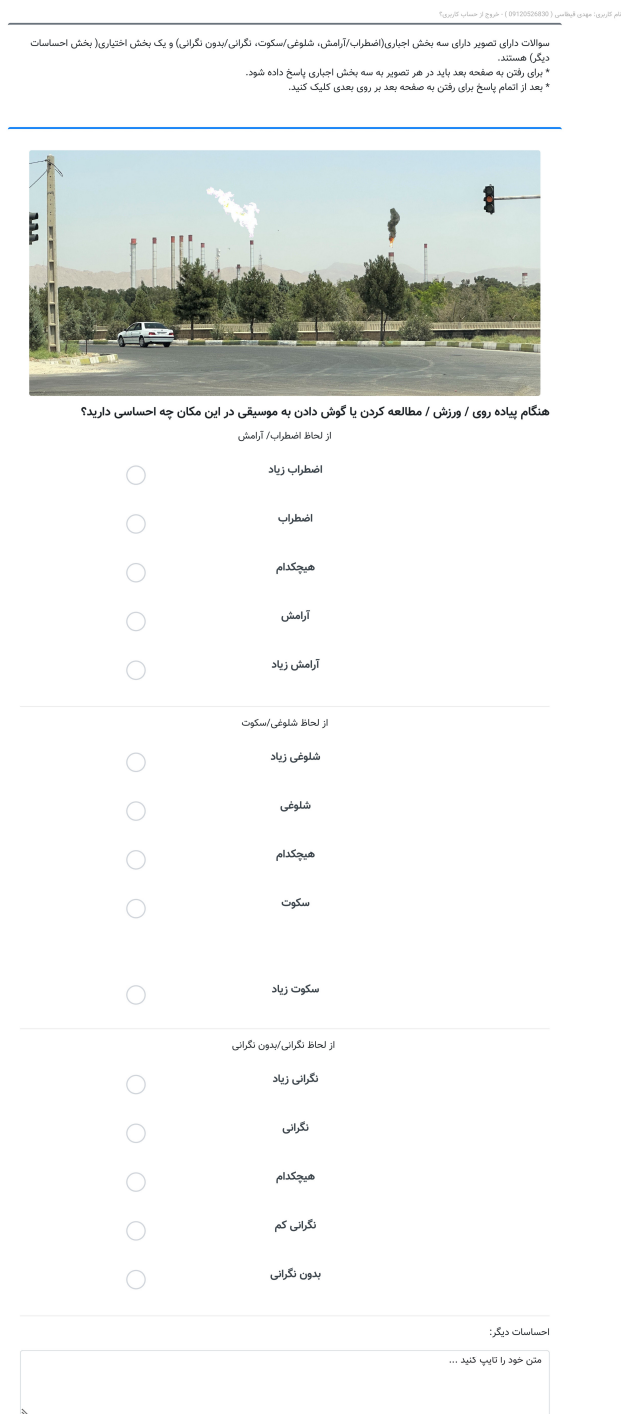
### *Design of the Survey*

The survey was eight pages long, written in Farsi language, and designed to be completed online. It was conducted online using the Porsall (<https://porsall.com/>, accessed on 6 August 2023) platform, allowing efficient and organized data collection. To ensure a diverse sample of participants, the researchers distributed the questionnaire via various channels, including popular social media platforms such as LinkedIn, WhatsApp groups, and Telegram channels. Furthermore, some surveys were completed in person, ensuring that people who had difficulty accessing the Internet were not excluded. The questionnaire was standardized across all formats to ensure data compatibility between LinkedIn, WhatsApp, Telegram, and in-person surveys with responses integrated into a unified database. Ethical considerations, including informed consent and participant confidentiality, were reviewed and approved by an Institutional Review Board (IRB) prior to survey administration.

The first section of the survey focused on mental health, specifically exploring how participants perceived stress arising from the presence of the Oil Refinery. The stress level was designed based on the Perceived Stress Scale provided by Cohen, Kamarck, and Mermelstein [24]. Despite its age, the PSS remains a popular method for evaluating how various situations influence feelings of stress. The scale's questions probe into individuals' thoughts and emotions. In this study, the short version of the scale, known as the PSS-4, was used. Participants were asked how frequently they experienced certain feelings or thoughts over the past month [25]. The following questions were treated individually:

1. How often have you felt that you were unable to control the important things in your life?
2. How often have you felt confident about your ability to handle your personal problems?
3. How often have you felt that things were going your way?
4. How often have you felt difficulties piling up so high that you could not overcome them?

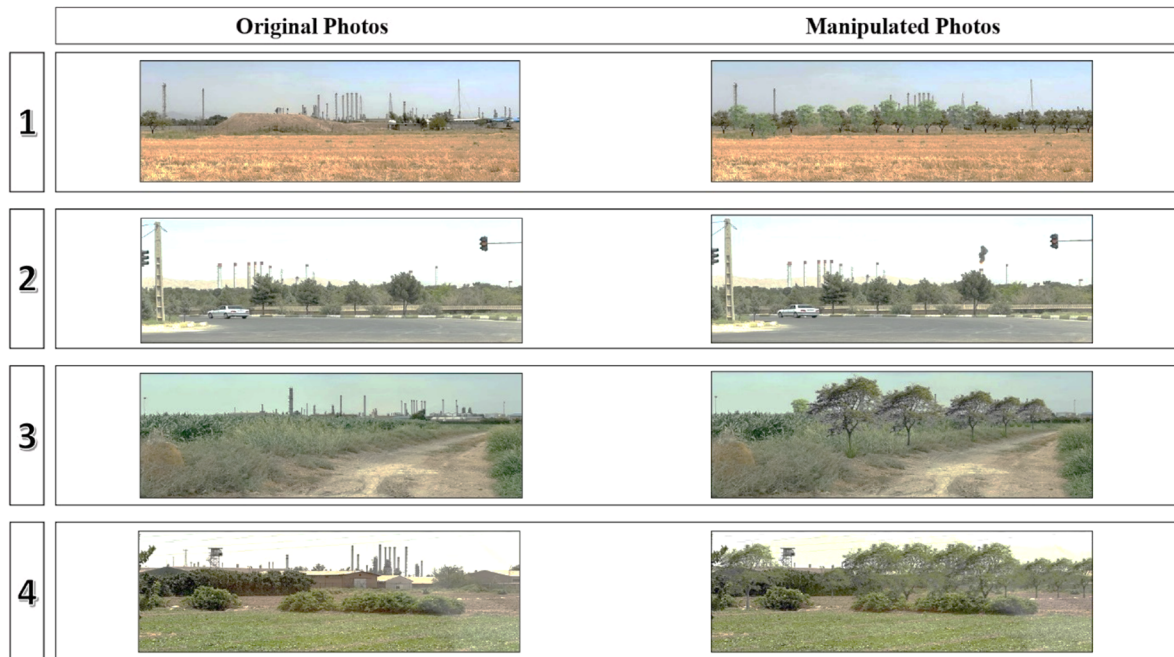
In the second section, participants were asked about their perceptions of landscape values using both original and edited photographs (Figure 2). This section was conceived considering a previous work conducted by Svobodova et al. [26], where the authors selected photographs based on the visibility of an oil refinery and people's awareness.



**Figure 2.** A screenshot of the online survey. (Translation: What are your feelings when you are going to study, listen to music, or do physical activity in this certain place?).

The four locations for photographs were carefully selected based on their representativeness of the area surrounding the Tehran Oil Refinery (Figure 3). The criteria for choosing these locations included proximity to residential areas, visibility of industrial elements, and environmental variation. Specifically, two locations were on the border between the Tehran Oil Refinery and the Bagher–Shahr Neighborhood to capture the interface between industrial and residential zones, while the other two were to the east of the refinery to offer different environmental perspectives. The photographs taken at these locations were then manipulated to assess the impact of industrial elements on participants’ perceptions. In three of the photographs (1, 3, and 4), the presence of the oil refinery and surrounding

industrial areas was minimized by enhancing natural elements like greenery and open sky. In contrast, photograph 2 emphasizes the industrial presence by including additional refinery smoke, fires, and intensified pollution indicators. These changes enabled a comparative analysis of how different levels of industrial visibility influence landscape perception and the resulting emotional and psychological responses.



**Figure 3.** Photographs captured at selected points.

Following that, the perception of landscape values was assessed using photographs, and participants were asked to use a set of adjectives for both original and manipulated photographs. Regarding the landscape values perception questions, participants were asked how they felt about the photographs while doing sports, reading, or walking in those areas. The adjectives were used according to the following three groups (Table 1):

1. Anxious/Serene;
2. Restless/Tranquil;
3. Tense/Calm.

**Table 1.** Adjectives description (Source: [27]).

Adjectives	Description
Anxious	feeling or showing worry, nervousness, or unease about something with an uncertain outcome.
Serene	peaceful and calm; worried by nothing.
Restless	unwilling or unable to stay still or to be quiet and calm, because you are worried or bored.
Tranquil	calm and peaceful and without noise, violence and worry.
Tense	nervous and worried and unable to relax.
Calm	peaceful, quiet, and without worry.

Finally, the third section included a demographic and social section to collect important information about the respondents. This section included information about age, gender, place of residence, level of education, and income.

### 3. Results

#### 3.1. Social–Demographic Findings

The participatory process involved a total of 220 participants. Eighty percent of responses were collected via online survey, and the rest were collected via interview. Also, one response was eliminated due to incorrect information. Females account for 52.27% of all respondents, while males make up 45.45% (Table 2). The 25–34 age group is the most represented (31.36%), which is followed by the 16–24 and 35–44 age groups. The data also show decreased participation among respondents aged 45 and older.

**Table 2.** Informant characteristics.

Age Group	Female	Male	N/A	Total
N/A	8.18%	9.09%	1.36%	18.64%
16–24 years	14.55%	7.73%	0.45%	22.73%
25–34 years	16.82%	14.55%	0.00%	31.36%
35–44 years	7.27%	10.00%	0.00%	17.27%
45–54 years	2.73%	1.82%	0.45%	5.00%
More than 55 years	2.73%	2.27%	0.00%	5.00%
Total	52.27%	45.45%	2.27%	100.00%

#### 3.2. Perceived Stress Scale

Table 3 shows the Perceived Stress Scale distribution of respondents. The perceived stress scale evaluates the self-reported amount of stress in the participants by assessing thoughts and feelings in the previous month.

**Table 3.** Perceived Stress Scale distribution of respondents.

Score	PSS-1	PSS-4	Score	PSS-2	PSS-3
Never (0)	16.82%	20.45%	Never (4)	14.09%	10.00%
Almost Never (1)	20.00%	20.91%	Almost Never (3)	31.36%	43.18%
Sometimes (2)	8.64%	10.00%	Sometimes (2)	6.36%	4.09%
Fairly Often (3)	50.91%	44.55%	Fairly Often (1)	45.00%	34.55%
Very Often (4)	3.64%	4.09%	Very Often (0)	3.18%	8.18%
Total	100%	100%	Total	100%	100%

After calculating the total scores for the Perceived Stress Scale (PSS), the scores were categorized into four levels to enhance readability. The categories are defined as follows:

- Low Stress: 0–4;
- Medium Stress: 5–8;
- High Stress: 9–12;
- Very High Stress: 13–16.

For example, if a participant's responses are as follows:

- Question 1 (PSS-1): Almost Never (score of 1);
- Question 2 (PSS-2): Very Often (score of 0);
- Question 3 (PSS-3): Sometimes (score of 2);
- Question 4 (PSS-4): Very Often (score of 4).

The total score is calculated as shown below: Total Score = Score of PSS-1 + Score of PSS-2 + Score of PSS-3 + Score of PSS-4 = 1 + 0 + 2 + 4 = 7. According to the categorization, a total score of 7 falls into the Medium Stress category.

Figure 4 shows the distribution among participants. It shows that the medium category, which corresponds to 4–8 scores, has the highest percentage (65%), which was followed by High (24%), Low (7%), and Very High (4%).

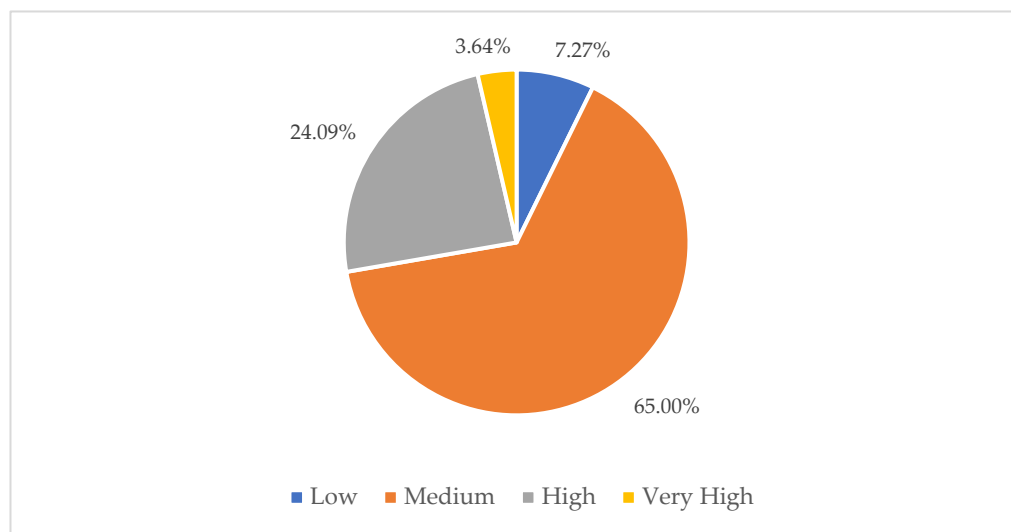


Figure 4. Distribution of level of perceived stress.

### 3.3. Landscape Values Perception Findings

#### Original Photographs Versus Manipulated Photographs

According to Table 4, people’s preferences to manipulated photographs tended to modify the original attribution given to the photographs slightly. For photographs 1 and 4, the manipulated version translated into lower negative opinions than in the original photographs, whereas in photograph 3, people expressed much more positive opinions, and in photograph 2, negative opinions were actually prevalent.

Table 4. Summary of people’s perception and emotions toward the landscape.

Photographs/Adjectives		Anxious/Serene	Restless/Tranquil	Tense/Calm
Photograph 1	Original	Anxious (50.45%)	Restless (35.35%)	Tense (52.73%)
	Manipulated	Anxious (39.09%)	Tranquil (37.73%)	Tense (43.18%)
Photograph 2	Original	Anxious (48.40%)	Restless (45%)	Tense (48.64%)
	Manipulated	Anxious (49.55%)	Restless (49.55%)	Tense (50%)
Photograph 3	Original	Anxious (53.18%)	Restless (31.82%)	Tense (51.82%)
	Manipulated	Serene (45.45%)	Tranquil (56.36%)	Calm (34.55%)
Photograph 4	Original	Anxious (46.82%)	Restless (40.91%)	Tense (45.91%)
	Manipulated	Anxious (35%)	Tranquil (44.55%)	Tense (38.64%)

Green color transparency reflects positive opinions, with dark green having significantly more positive opinions in manipulated photographs than in original photographs and displaying a range of positive opinions from very low (light green color) to very high (dark green color). Finally, the gray color indicates that the manipulated photos have more negative opinions than the original photographs.

### 3.4. Relationship Between Stress Level and Landscape Values Perception

Multinomial logistic regression determined the relationship between stress level and value perception. Table S1 (Supplementary Material) presents the results of a series of linear regressions examining the differences in the perceived stress levels under different conditions of emotional perception for specific photographs. The photographs are categorized based on the emotional states they evoke: Anxious/Serene, Restless/Tranquil, and Tense/Calm. Comparisons are made across different stress levels (High, Medium, and Very

High) relative to a low-stress baseline. The critical metrics presented for each condition are the estimate, lower and upper bounds of the 95% confidence interval, standard error (SE), Z-score, and *p*-value. Each emotional state category has “Neutral” as a reference level, which means that comparisons are made against this neutral baseline. For example, when studying how Serene, Anxious, Tranquil, Restless, Tense, or Calm perceptions affect stress, these effects are compared to how “Neutral” perceptions influence stress.

Similarly, “Low” stress is the reference category. This means that changes in stress due to emotional perceptions are compared to a low-stress baseline. Each stress level (medium, high, and very high) is evaluated based on how much more or less stress is perceived than the low-stress level.

According to Table S1, for those respondents indicating a High–Low stress level and judging photograph 2 (Anxious/Serene), “Anxious–Neutral” had a significant negative effect ( $-5.4329$ ,  $p = 0.026$ ). In addition, in photograph 1 (Restless/Tranquil), “Very Tranquil–Neutral” had a very high estimate (22.6392) with a very significant *p*-value ( $<0.001$ ). Also, in photograph 2 (Tense/Calm), “Very Calm–Neutral” had a very high estimate ( $-31.1297$ ) with a very significant *p*-value ( $<0.001$ ).

For the respondents indicating a Medium–Low stress level and judging photograph 1 (Anxious/Serene), “Very Serene–Neutral” had a high estimate (117.9843) with a very significant *p*-value ( $<0.001$ ). Also, for photograph 2 (Anxious/Serene), there were some positive and negative estimates with a high significant *p*-value (“Anxious–Neutral”, “Serene–Neutral”, “Very Serene–Neutral”). Also, for photograph 4 (Anxious/Serene), respondents who indicating feeling “Very Anxious–Neutral” had a negative estimate of  $-8.7050$  with a significant *p*-value of 0.027. In a Restless/Tranquil emotional state, for photograph 1, respondents who indicating feeling “Very Tranquil–Neutral” had a positive estimate (222.2857). Also, for photograph 4, respondents who indicating feeling “Very Tranquil–Neutral” had a negative estimate ( $-7.9392$ ). Also, there were two significant negative estimates in a tense or calm emotional state, which were followed by “Calm–Neutral” in photograph 2 and “Very Tense–Neutral” in photograph 3.

For respondents who reported Very High–Low stress levels, and Anxious/Serene emotional states, for photograph 1, there was a highly significant negative estimate of “Very Serene–Neutral”. Also, for photograph 2, there were two negative estimates with a very high significant *p*-value, which were followed by “Serene–Neutral” and “Very Serene–Neutral”. For the Restless/Tranquil emotional state, there was a negative estimate ( $-0.0321$ ) with a very high significant *p*-value for photograph 2 (Very Tranquil–Neutral”) and a positive estimate (8.2108) for photograph 1 (“Very Tranquil–Neutral”).

## 4. Discussion

### 4.1. General Observations

The investigation of visual perception in industrial areas represents a crucial aspect of urban planning and design, and a significant correlation has been observed between this phenomenon and perceived stress. Gaining insight into how individuals perceive and interpret their environment in these areas enables urban planners and designers to make strategic choices aimed at perceived stress reduction and the enhancement of safety. This process involves carefully considering various factors, including the visual aesthetics of industrial zones, the clear visibility of potential hazards, and the general visual effect on the local community.

Several studies [1,6–11,13,14,23] have consistently demonstrated the positive impact of urban green spaces as landscape values on reducing stress levels and promoting overall well-being and explored the restorative effects of green environments on mental health,

emphasizing the significance of landscape characteristics and spatial distribution in influencing stress levels and psychological well-being in urban settings.

Compared to other studies, the present study provided insights into various topics, including perceived stress levels and the emotional impact of photograph manipulation, all of which have important implications in urban planning and management.

The analysis of engagement patterns in perceived stress levels indicates that most participants, accounting for 65% of respondents, fall within the medium stress category, including scores ranging from 4 to 8. Subsequently, a significant proportion of individuals, precisely 24%, encounter high levels of stress. Conversely, a smaller percentage of 7% undergo low-stress levels, while 4% endure extremely elevated stress levels. The distribution of stress levels among respondents emphasizes the high occurrence of moderate stress and emphasizes the significance of comprehending how stress is perceived to provide targeted interventions and support. The fact that most respondents reported medium stress is noteworthy, but its significance is limited by the sample's representativeness. The current data may not accurately represent the study area's overall population. As a result, while the prevalence of medium stress is significant, additional research with a more representative sample is required to validate these findings and ensure broader applicability.

The study's comparison of emotional perceptions in original and manipulated photographs reveals that visual changes significantly impact viewers' emotional perceptions. The effectiveness of these manipulations in altering perceptions of restlessness suggests a complex interaction between visual elements and perceived emotions, emphasizing the importance of visual signals in image processing. For example, photograph 3 is perceived as an anxious place in the original photograph but a serene place in the manipulated photograph.

The linear regression analysis of the impact of emotional perceptions on stress levels reveals significant variations across different emotional states and photographs. While some predictors show statistically significant associations with stress levels, others do not. The emotional perception of manipulated photographs impacts perceived stress levels, particularly serene and tranquil perceptions, which consistently show a decrease in stress. However, the effects vary depending on the individuals' initial stress level. Emotional perceptions significantly impact stress levels with notable variations depending on emotional state and context (photograph).

The most consistent significant predictors are observed in the very serene and very tranquil states, implying that these states can significantly reduce or increase stress levels, depending on the context (photograph).

These findings highlight the intricate interplay between stress perception, environmental appraisal, and individual stress levels, providing insight into the complex dynamics that shape people's emotional responses to their surroundings.

#### *4.2. Implications for Planning*

The study's findings have significant implications for urban planning and design, particularly in terms of managing and reducing perceived stress in industrial areas. First, engagement trends highlight the importance of inclusive and adaptable participatory methods that bridge the digital divide and increase community involvement in planning processes. Second, the link between industrial structure visibility and stress emphasizes the importance of strategic landscape design, which includes visual screening, as part of mental health management. Green spaces, for example, significantly improve landscape aesthetics and reduce stress levels, making them critical components of urban and environmental design. While addressing all health impacts, including those caused by petrochemical operations, is critical, incorporating greenery can reduce adverse effects by promoting

mental health and ecological balance. Thus, balancing industrial activities with green space integration benefits both the environment and public health.

This study also emphasizes the link between perceived stress and landscape value perception, urging urban planners and designers to create multifunctional public spaces infused with natural elements. Furthermore, the use of photo manipulation to change emotional perceptions suggests that visual media interventions can boost public well-being and foster positive attitudes toward industrial areas

## 5. Conclusions

This study evaluates how targeted interventions affect perceived stress and explores the emotional impact of photograph manipulation. It demonstrates that altering photographs can improve emotional responses to industrial settings, suggesting that this approach is a promising tool for enhancing public well-being and perception through visual media. The study also highlights the benefits of integrating participatory methods, such as using manipulated photographs to advocate for community concerns and goals. These images can effectively support public advocacy and mobilize community support by providing visual evidence of potential impacts.

The study faced several limitations that may affect the generalizability and validity of its findings. First, restricted internet access in Iran and low participation from Bagher-Shahr residents, many of whom were undocumented immigrants with limited literacy, limited the sample size and demographic diversity. This highlights the need for more inclusive and adaptable research methods in future studies. Additionally, the reliance on online surveys and a small, demographically limited sample restricts the generalizability of the findings, calling for further exploration of how these results apply to other industrial regions globally.

The study also employed self-reported stress scales, which may introduce subjective bias and affect the validity of the conclusions. Moreover, using a limited set of four photographs and their manipulated versions to represent the landscape around the refinery provided focused insights. However, it could have been expanded with a more extensive set of images to enhance the comprehensiveness of future studies.

Furthermore, the research focused primarily on visual impacts and did not account for other potential stressors, such as odors, which may also influence stress levels and perceptions of the environment. Future studies could incorporate multi-sensory analyses to provide a more comprehensive understanding of the environmental influences on stress.

Finally, the absence of control scenes without the refinery poses another limitation. Including such scenes could have helped isolate the stress associated with the refinery. Without these control scenes, it is difficult to determine whether the observed stress is solely due to the refinery's presence or a broader consequence of living in the vicinity, including factors like fear of the refinery being a target for bombing or other socio-political concerns. This limitation may hinder the ability to fully assess the direct impact of the refinery on residents' mental health and landscape perception.

**Supplementary Materials:** The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/land14010064/s1>. Table S1. Impact of Emotional Perceptions on Stress Levels: A Linear Regression Analysis.

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**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki, and Approved by the ETHICAL COMMITTEE CONCERNING RESEARCH INTO PEOPLE, SOCIETY AND THE ENVIRONMENT OF THE UNIVERSITAT ROVIRA I VIRGILI (CEIPSA) (CEIPSA-2021-PR-0026, 10 November 2022).

**Data Availability Statement:** The original contributions presented in this study are included in the article/Supplementary Material. Further inquiries can be directed to the corresponding author.

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