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Climate Change Awareness, Eco-Friendly Social Norms, and Sustainable Lifestyle Practices through Green Self-Efficacy

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ABSTRACT

Climate change has increasingly required shifts in everyday behavior, yet sustainable lifestyle practices often depend not only on awareness but also on social influence and individual confidence to act. This study examined the role of climate change awareness and eco-friendly social norms in shaping sustainable lifestyle practices through green self-efficacy. A quantitative research design was used, and data were collected through a structured questionnaire from young adults and community respondents. The study focused on sustainable practices such as energy conservation, reduced plastic use, recycling, responsible consumption, and environmentally friendly transport choices. The findings indicated that higher climate change awareness was associated with stronger sustainable lifestyle practices, while eco-friendly social norms encouraged individuals to adopt environmentally responsible behaviors. Green self-efficacy further strengthened this relationship by increasing individuals' confidence in their ability to perform sustainable actions. The study contributed to climate behavior research by highlighting the importance of awareness, social pressure, and self-belief in promoting sustainable living.

Keywords: *Climate Change Awareness, Eco-Friendly Social Norms, Green Self-Efficacy, Sustainable Lifestyle Practices, Climate Behavior*

INTRODUCTION

The issue of climate change has become one of the most pressing challenges of today because it affects ecosystems, livelihood, health, consumption behaviors, and even households' daily decisions. Nonetheless, addressing climate change cannot be achieved through government policy actions and technology alone; it requires behavioral changes from both individuals and communities. Living sustainably by using energy wisely, engaging in recycling activities, reducing plastic consumption, being an ethical purchaser, and choosing appropriate means of transportation are becoming key strategies of responding to climate change. Modern behavioral research indicates that there is a positive link between the perceptions of climate change, personal environmental norms, and environmental behavioral intentions (Perera et al., 2022). In other words, people have a higher likelihood to behave in an environmentally sustainable way when they

understand the seriousness of climate change and its personal impact on them. Nevertheless, people's climate emotions and perceptions also affect their pro-environmental behavior (Pinho, 2025).

In regional and Pakistani context, the climate change issue assumes additional significance due to its linkages with issues related to livelihoods, urban living conditions, energy consumption, waste management, and awareness. Pakistan has been suffering from heat waves, floods, water stress, and air pollution on several occasions, making the practice of sustainable behavior a pressing need rather than just being an environmental concern. In a quantitative study conducted in Pakistan, it has been found that the perception of climate change and subjective norms had significant impacts on intention to engage in climate change behavior, while the intention was found to have predicted the pro-environmental behavior (Abdelwahed et al., 2022). Likewise, a study involving young adults in Pakistan revealed that direct experience with climate change issues was linked with strong individual and social norms, efficacy belief, and pro-environmental behavior. Thus, the issue of climate change awareness, eco-friendly norms, and green self-efficacy is very relevant in the Pakistani context.

Climate change awareness is an individual's consciousness of the causes of climate change, its effects, dangers, and solutions. Climate change awareness comprises information about global warming, greenhouse gases, environment destruction, extreme weather, pollution, depletion of resources, and human behavior that can worsen or alleviate the effects of climate change. Cognitive awareness relates to knowledge, whereas behavioral awareness concerns the actions based on the knowledge about climate change. The recent research conducted in Türkiye has shown that climate change awareness, knowledge, and perceptions of risks have a significant effect on environmental attitudes and behavior, especially among those who perceive climate change risks as direct and high (Gazeloğlu, 2026). Still, awareness of climate change does not lead to sustainable behaviors in all cases since costs, convenience, habits, and cultural norms can decrease the probability of transforming awareness into practice. Thus, climate change awareness is necessary but not sufficient for sustainability.

Green social norms can be defined as expectations, pressures, and role models from family members, friends, community members, teachers, media, and society at large. These social norms could be either descriptive when people behave in the same manner as what other people around them do, or injunctive when people feel obliged to behave in certain ways because of what others think and expect from them. When we consider the impact of social influence on human behavior, green social norms play an important role in the sense that such norms help make pro-environmental actions socially desirable. Studies on pro-environmental behavior have demonstrated that subjective norms play an important role because pro-environmental behaviors are largely shaped by social acceptance and peer discussions (Liao, 2024). Similarly, studies indicate that social norms, along with self-efficacy and collective efficacy, play an important role in environmentally responsible behavior (Qiu, 2025).

Green self-efficacy is defined as an individual's confidence in his ability to effectively engage in environmentally responsible behavior. Such self-efficacy involves the perception that one has the capability to save on energy consumption, abstain from using plastic materials, recycle properly, engage in responsible consumption, travel through sustainable transport modes, and persuade other people towards being more green. Green self-efficacy plays an intermediary role between awareness and engagement in the behavior because individuals who are aware of the gravity of climate change will not engage in pro-environmental actions due to perceived powerlessness. Empirical research conducted among university students proves that environmental self-efficacy and social norms play a mediating role between sustainability education and pro-environmental actions (Zhang & Cao, 2025). Sustainable lifestyles consist of recurring behaviors which minimize environmental damage and ensure climatic responsibility and include such behaviors as energy-saving, waste-sorting, decreased usage of single-use plastics, green consumption, and low-carbon

transport. Such behaviors can be reinforced by an individual's green self-identity and self-efficacy (Pasquariello et al., 2025).

Climate change calls for a shift in lifestyle behaviors of people, which, however, continue engaging in behaviors that contribute to increased pressure on the environment. The problem is that the knowledge of climate change is not accompanied by sustainable behaviors of people like energy saving, avoidance of plastic products, recycling, responsible consumption, and using transportation means that do not harm the environment. Recently published international research from China and Pakistan has revealed a positive connection between climate-related intentions and energy saving, proper sorting of garbage and avoidance of single-use plastics but these behaviors differ in various situations and depend on psychological and social factors (Iqbal et al., 2026). It means that sustainable behaviors cannot be explained by the awareness of people only. Even though people know about climate dangers, they still neglect them due to convenience, costs, lack of social support, and low self-efficacy to achieve something meaningful. Thus, the impact of climate change awareness and social norms related to ecological issues should be investigated in regard to sustainable lifestyles through the prism of green self-efficacy (Andrade & Vieites, 2025).

Prior research has focused on climate awareness, environmental attitudes, social norms, PBC, and pro-environmental behavior, but many critical areas are unexplored in terms of understanding the interaction between these variables to explain sustainable practices. A systematic literature review on the role of social norms and pro-environmental behavior suggests that even though the effect of norms is well acknowledged, it varies across different cultures, self-construals, and behaviors; hence, further culture-specific research is required (Saracevic & Schlegelmilch, 2021). In addition, a new study done in a developing country found that environmental attitudes, social influence, PBC, and consumer effectiveness lead to sustainable practices. However, the focus of such research is mostly on consumer behavior, and there is a lack of models that combine the effect of climate change awareness, eco-social norms, green self-efficacy, and sustainable practices in the same framework. This is particularly relevant for the case when environmental hazards are significant but sustainable lifestyle practices are inconsistent (Masengu et al., 2025).

The study's significance lies in its ability to describe the sustainable lifestyle behavior in terms of awareness, social influence, and personal self-confidence and not as something caused purely by environmental awareness. In terms of academia, the study is important in climate behavior research since it highlights the impact of climate change awareness and eco-friendly social norms on sustainable behavior through green self-efficacy. On a practical level, the study is useful in designing climate change awareness campaigns for educational establishments, governments, environmental agencies, and communities. This is because the study identifies key factors that will enable the design of climate change interventions that go beyond information provision and concentrate on building confidence and social influence and giving behavioral guidelines. The study is useful in encouraging sustainable behaviors like energy conservation, plastic conservation, recycling, consumption behaviors, and using green transport.

Research Objectives

The study aims to achieve the following objectives:

1. To examine the effect of climate change awareness on green self-efficacy.
2. To investigate the effect of climate change awareness on sustainable lifestyle practices.
3. To assess the effect of eco-friendly social norms on green self-efficacy.
4. To examine the effect of eco-friendly social norms on sustainable lifestyle practices.

5. To determine the effect of green self-efficacy on sustainable lifestyle practices.

6. To examine the mediating role of green self-efficacy in the relationship between climate change awareness and sustainable lifestyle practices.

7. To investigate the mediating role of green self-efficacy in the relationship between eco-friendly social norms and sustainable lifestyle practices

LITERATURE REVIEW

Awareness about climate change is one of those aspects that has traditionally been associated with sustainable behavior. Recent findings indicate that mere awareness does not guarantee the change in one's lifestyle related to sustainable behaviors. Individuals become aware of what causes climate change and what negative outcomes might be expected from this phenomenon. However, the behavioral effect of this aspect depends on the ability of individuals to combine information about climate change with something that can be done on a regular basis. Akakpo et al. (2024) have found a positive association between the knowledge and information literacy self-efficacy concerning climate change and pro-environmental behavior of university students, which means that the effect of mere awareness is quite low. In contrast, Shershunovich and Mirzabaev (2026) prove that information about climate change provided via media affects sustainable consumption behavior directly and indirectly.

It is also seen from the literature that climate awareness increases as climate change is associated with experience, place, and risk. According to Yoon et al. (2025), climate change awareness was found to have an effect on both on-site and off-site pro-environmental behavior for the urban park visitors, where place identity and social bonding were considered to be important mediating variables for this relationship. It indicates that awareness is more powerful if one feels emotionally and socially attached to the environment he/she wants to protect. Hu et al. (2026) have similarly found that extreme weather experience results in greater environmental concern and pro-environmental behavior. However, it does not mean that media influence was always significant in terms of public and private actions. As can be seen, compared to the above-mentioned studies, these two studies do not explain climate awareness based on knowledge, but show that it is related to experience, concern, and vulnerability to climate threats.

Social norms conducive to environmental sustainability constitute another significant reason for sustainable lifestyles since environmental behaviors are socially perceived, rewarded or sanctioned. As shown by Niu et al. (2023), social norms fostered environmental behaviors; however, this effect is contingent upon the level of personal costs incurred and partially mediated by personal norms. This is particularly relevant since sustainable behaviors such as recycling, reduction of plastics, and consumption of eco-friendly goods may involve additional expenses or inconvenience. In addition, Krettenauer et al. (2024) revealed that pro-environmental behaviors, nature connectedness, and endorsement of pro-environmental norms co-evolve with each other among adolescents. Hence, compared to purely individual factors, the discussed studies demonstrate that sustainable lifestyle practices are influenced by socially shared expectations, peer influences, moral endorsement, and group-specific environmental values. It is therefore possible to say that eco-friendly social norms turn climate concerns into socially reinforced behavioral norms.

Green self-efficacy plays an important role in the literature since one might know about the climate change problem and might be aware of environmental norms but still refrain from doing anything if the feeling of powerlessness and incapability takes place. According to Qin et al. (2024), the positive relation between green self-efficacy and pro-environmental behavior as well as the moderating effect of green self-efficacy on the link between future self-continuity and pro-environmental behavior in adolescents have been revealed. It means that confidence could allow individuals to transform their concern for the future into

environmental activities at the present time. Furthermore, Vrselja et al. (2024) showed that self-efficacy and collective efficacy played a role in explaining the link between socioeconomic status and climate mitigation behavior. In comparison with the above results, it should be noted that efficacy is both individual and collective; one should believe in oneself but also in the collective impact on the environment.

METHODOLOGY

The research methodology used for this study comprised a quantitative research design which was based on a positivist research philosophy. This positivist research philosophy was considered to be the most appropriate because the research intended to measure the observable variables, statistical relationships between them, and explanation of sustainable lifestyle behaviors through numeric data. In the present research, cross-sectional survey design was selected because all the data was collected from respondents at one particular time period about their awareness of climate change, eco-friendly social norms, green self-efficacy, and sustainable lifestyle behaviors. It was appropriate to choose this research design because the goal of the research was to test the measurable relationships rather than analyzing people's experiences.

Participants of the research were made up of young adults and participants of the community living in Lahore, Pakistan, who were aware of various environmental problems and performed regular actions regarding their consumption, movement, and housekeeping. It was chosen as the area for conducting research due to the fact that it is one of the key urban areas of Pakistan that suffers from such environmental problems as air pollution, poor waste management, traffic jams, excessive energy consumption, and urban stress caused by climatic factors. Participants were taken into account because sustainability of lifestyle can be observed through daily actions such as energy saving, low usage of plastics, recycling, responsible consumption, and eco-friendly transportation. Data were gathered using a structured survey consisting of close-ended questions. Survey questions concerned demographic characteristics, knowledge about climate change, eco-friendliness of social norms, green self-efficacy, and sustainable lifestyle. It used the scale of Likert to estimate the degree of agreement of the respondents with statements.

SmartPLS 4 was used to analyze the data as the proposed model had more than one latent construct as well as an indirect relationship via green self-efficacy. PLS-SEM was a good choice for this analysis because the current research studied measurement quality as well as structural relationships in one model. Measurement model was tested based on loadings, Cronbach’s alpha, composite reliability, average variance extracted, and discriminant validity. Structural model was tested based on path coefficients, t-value, p-value, confidence interval, coefficient of determination, effect size, and bootstrapping. SmartPLS 4 was chosen as the statistical tool because it provides a range of new features for estimating models, assessing predictive relevance, detecting endogenous variables, and evaluating PLS-SEM (Cheah et al., 2024).

Ethics were observed throughout the entire research process. Participation was voluntary and respondents were made aware of the purpose of the study before filling out the questionnaire. Informed consent was sought and respondents were told that they could refuse to take part in the research or opt-out at any point in time without suffering any punishment. No identification data such as names, telephone numbers, email addresses, or identity numbers was collected. The information provided was used solely for academic reasons and would remain confidential. The questionnaire was written in an easy to understand language for the respondents to be able to comprehend the questions prior to responding to them. Ethical surveys are significant as participants must understand the purpose, conditions of confidentiality, voluntary participation, and risks of participation before seeking consent (Grant et al., 2025).

RESULTS

Reliability Analysis

Table 1 Reliability Analysis Results

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Climate Change Awareness	0.761114	0.792605	0.814315	0.501336
Eco-Friendly Social Norms	0.832935	0.834282	0.868207	0.506024
Green Self-Efficacy	0.764691	0.770967	0.828264	0.509031
Sustainable Lifestyle Practices	0.78973	0.802233	0.832547	0.5145

The reliability and convergent validity testing of the measurement model is illustrated in Table 1. Based on the results presented in Table 4.1, it can be noted that all the constructs demonstrated sufficient internal consistency with Cronbach's alpha values falling between 0.761 and 0.833, higher than the acceptable value of 0.70. Moreover, rho_A values falling within the range of 0.771 to 0.834 further corroborate the reliability of the constructs. Values of Composite Reliability (CR) fall within the range of 0.814 to 0.868, demonstrating sufficient internal consistency and being greater than the minimum recommended value of 0.70. Additionally, the values of Average Variance Extracted (AVE) are within the range of 0.501 to 0.515, higher than the acceptable value of 0.50, which implies adequate convergent validity.

Validity Analysis HTMT

Table 2 Validity Analysis

	Climate Change Awareness	Eco-Friendly Social Norms	Green Self-Efficacy
Climate Change Awareness			
Eco-Friendly Social Norms	0.666743		
Green Self-Efficacy	0.614434	0.643752	
Sustainable Lifestyle Practices	0.675035	0.718174	0.665615

Table 2 gives the Heterotrait-Monotrait Ratio (HTMT) values that were utilized for the discriminant validity evaluation of the measurement model. All HTMT values vary from 0.614 to 0.718, none exceeding the recommended cut-off value of 0.85 (even the slightly higher cut-off value of 0.90). More precisely, the HTMT values are 0.667 for the Climate Change Awareness and Eco-Friendly Social Norms constructs, 0.614 for the Climate Change Awareness and Green Self-Efficacy constructs, 0.675 for the Climate Change

Awareness and Sustainable Lifestyle Practices constructs, 0.644 for the Eco-Friendly Social Norms and Green Self-Efficacy constructs, 0.718 for the Eco-Friendly Social Norms and Sustainable Lifestyle Practices constructs, and 0.666 for the Green Self-Efficacy and Sustainable Lifestyle Practices constructs. This means that all four constructs under consideration can be distinguished empirically, and thus have good discriminant validity.

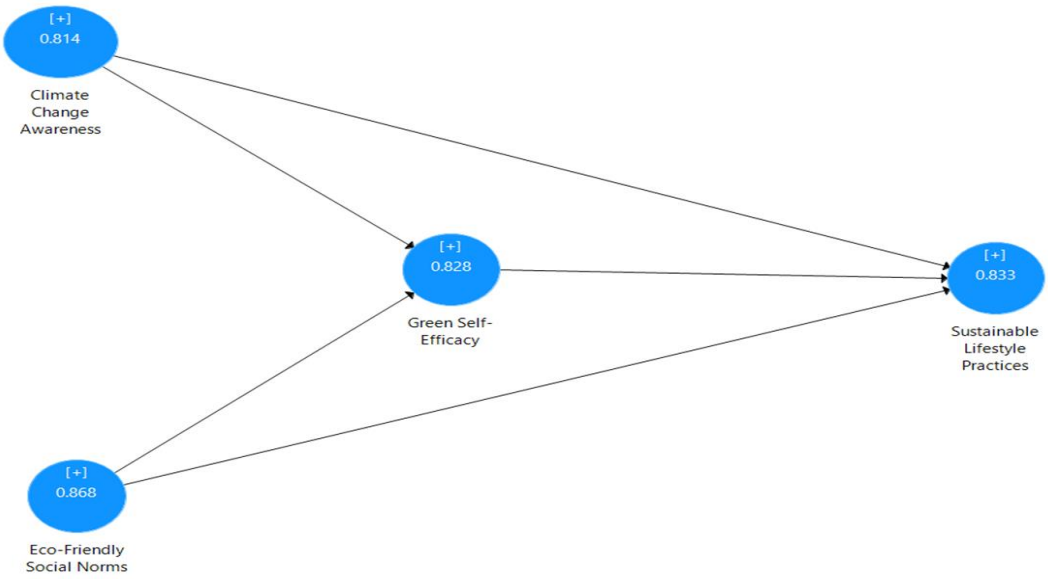


Fig 1 Measurement Model

Structural Model Assessment and Hypothesis Testing

Table 3

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Climate Change Awareness -> Green Self-Efficacy	0.288568	0.29335	0.037611	7.672376	0
Climate Change Awareness -> Sustainable Lifestyle Practices	0.478292	0.478629	0.034648	13.80442	0
Eco-Friendly Social Norms -> Green Self-Efficacy	0.371542	0.373061	0.039	9.526666	0

Eco-Friendly Social Norms -> Sustainable Lifestyle Practices	0.40876	0.408477	0.03508	11.65235	0
Green Self-Efficacy -> Sustainable Lifestyle Practices	0.074211	0.074256	0.026827	2.766279	0.005876

The results of the structural model evaluation and hypothesis testing are shown in Table 4.3. The analysis shows that all the direct relationships suggested by the hypotheses are positive and statistically significant. Climate Change Awareness positively and significantly affects Green Self-Efficacy (β = 0.289, t = 7.672, p < .001) and Sustainable Lifestyle Practices (β = 0.478, t = 13.804, p < .001). In the same vein, Eco-Friendly Social Norms positively and significantly impact Green Self-Efficacy (β = 0.372, t = 9.527, p < .001) and Sustainable Lifestyle Practices (β = 0.409, t = 11.652, p < .001). Moreover, Green Self-Efficacy exerts a positive and significant influence on Sustainable Lifestyle Practices (β = 0.074, t = 2.766, p = .006). Since all the t-statistics are above 1.96 and all the p-values are less than 0.05, all the direct hypotheses are validated. Thus, the results obtained demonstrate that Climate Change Awareness, Eco-Friendly Social Norms, and Green Self-Efficacy significantly affect Sustainable Lifestyle Practices among the participants.

Mediation Analysis

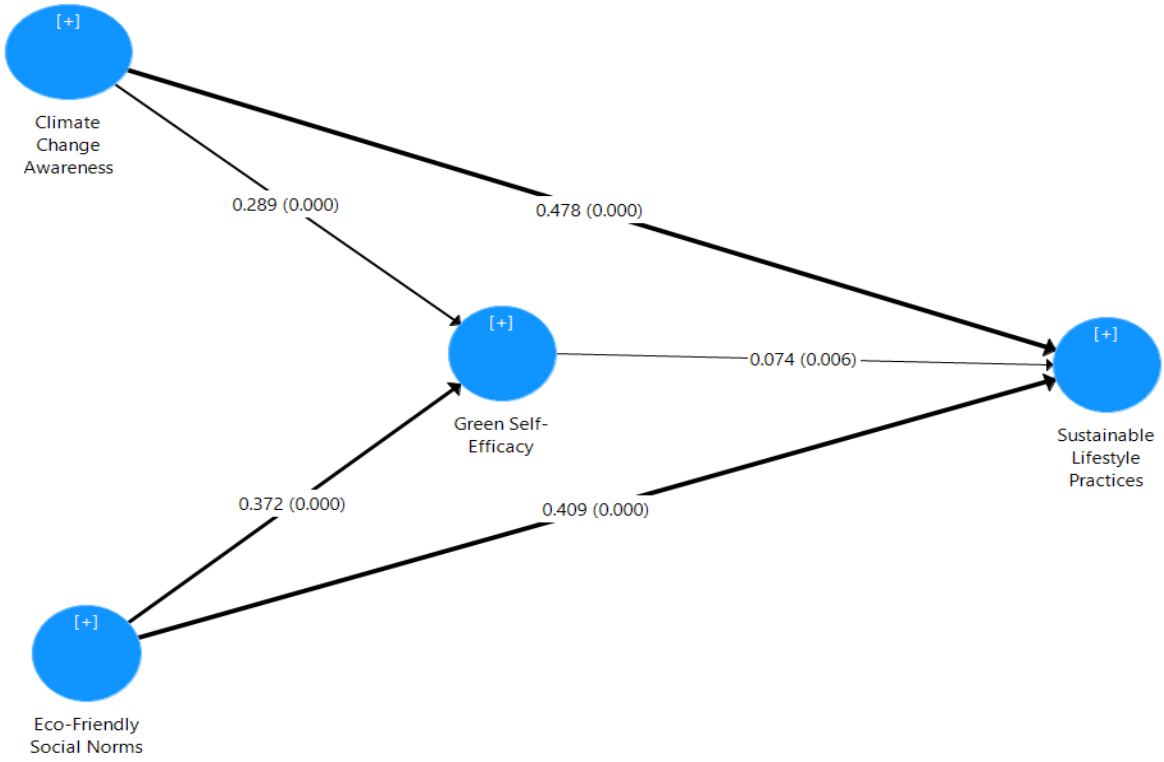
Table 4 Mediation Analysis Results

	Original Sample (O)	Sample Mean (M)	T Statistics	P Values
Climate Change Awareness -> Green Self-Efficacy -> Sustainable Lifestyle Practices	0.021415	0.021813	2.503083	0.012623
Eco-Friendly Social Norms -> Green Self-Efficacy -> Sustainable Lifestyle Practices	0.027573	0.027839	2.583145	0.010068

Table 4 below shows the results of the mediation analysis regarding the mediation effects of Climate Change Awareness and Eco-Friendly Social Norms on Sustainable Lifestyle Practices via Green Self-Efficacy. The results reveal that Green Self-Efficacy mediates the effect of Climate Change Awareness on Sustainable Lifestyle Practices (β = 0.021, *t* = 2.503, *p* = .013). Also, Green Self-Efficacy mediates the effect of Eco-Friendly Social Norms on Sustainable Lifestyle Practices (β = 0.028, *t* = 2.583, *p* = .010). As the t-values are greater than the critical value of 1.96 and the p-values are less than 0.05, both the indirect effects of Climate Change Awareness and Eco-Friendly Social Norms on Sustainable Lifestyle Practices through Green Self-Efficacy are statistically significant. The results therefore confirm the formulated mediation hypotheses, which suggests that Climate Change Awareness and Eco-Friendly Social Norms increase Sustainable Lifestyle Practices both directly and indirectly by increasing Green Self-Efficacy of individuals.

Fig 2 SEM PLS Model

DISCUSSION AND CONCLUSION



Based on the estimated results, climate change awareness positively affected sustainable lifestyle behaviors. In other words, respondents who had high levels of awareness about climate risks, environmental destruction, and the role of humans in climate change were inclined to conserve energy, reduce plastic use, recycle, consume responsibly, and choose environmentally-friendly means of transportation. The finding is reasonable since knowledge creates the basis for understanding the importance of making particular lifestyle choices. At the same time, it should not be concluded that awareness is sufficient to change people's actions in this regard. Thus, according to Shershunovich (2025), climate risk perception highly positively affected pro-environmental behavior, although self-efficacy and group activities played an important role

as well. Kotyza et al. (2024) discovered that, unlike social norms, environmental concern and perceived behavioral control positively affected pro-environmental intentions.

Moreover, it was revealed that climate change awareness influenced sustainable behaviors via green self-efficacy. Thus, although individuals have awareness regarding climate change, they may take actions towards sustainability only when they think that their actions are practical and controllable. In other words, green self-efficacy is considered a psychological mediator between having knowledge and performing actions. Zeng et al. (2023) reported that environmental knowledge and risk perception influence sustainable consumption via environmental concern and pro-environmental behavior. Such research confirms the necessity of creating motivational links between having awareness and performing sustainable behavior. Maleknia and Zamani (2025) also revealed that environmental literacy explains ecotourists' pro-environmental behavior via knowledge-attitude-practice mediation. Thus, this research also confirms that climate awareness should not be an abstract notion but should turn into a motivation to perform actions.

In addition to that, the findings further imply that eco-friendly social norms played a positive role in shaping sustainable lifestyle practices. In essence, the respondents tended to exhibit sustainable behaviors when they thought that their family members, peers, members of the community, or people they know believed in environmentally responsible behaviors. It is vital for social norms to come into play since behaviors are socially visible and reinforced in the environment that we operate. In other words, such behaviors as recycling, avoiding using plastic bags, energy conservation, or public transport can become more comfortable to perform if these behaviors are common within your social environment. According to Gan et al. (2025), the subjective norms and green self-efficacy acted as mediators in the relation between the attitudes towards the environment and environmentally responsible behaviors among university students. Also, Liao (2025) noted that media-based awareness and responsibility influenced pro-environmental behaviors through personal norms, while self-efficacy intensified the norm-behavior relationship.

The importance of sustainable social norms cannot be overstated since sustainable living is not an individual activity alone but one that is socially patterned as well. In a city like Lahore, which sees consumption, transportation, waste generation, and energy usage socially patterned, individual actions might easily be influenced by what others think and do. Social networks affect pro-environmental action through environmental risk perceptions, according to Yang et al. (2026). Social networks affect how people perceive and react to environmental issues. The work done by Xin et al. (2026), which shows that peer influence has more impact on pro-environmental volunteer work among college students than peer selection, supports this conclusion. Thus, the results indicate that sustainable lifestyle promotion efforts should not just emphasize individual understanding alone. Instead, they should promote socially accepted environmentally sustainable behavioral patterns in peer, community, and institutional contexts.

The estimation of all these variables indicates a combination of explanations for sustainable lifestyle practices. Awareness of climate change is considered to be the basis of knowledge in this case, eco-friendly social norms constitute the encouragement from society while green self-efficacy transforms these factors into actions. It means that sustainable lifestyle practices will occur only when individuals become aware of climate change dangers, see environmental sustainability around them, and feel that they have personal ability to make such practices themselves. Hristova et al. (2025) revealed that environmental attitudes could predict pro-environmental behavior effectively; however, according to their results, psychological factors should not be ignored besides the knowledge factor. Fabio and Manoti (2026) discovered the influence of critical thinking and emotions on sustainable practices indicating that climate behavior is determined by cognitive and emotional factors as well. That is why this research makes a contribution through proving that sustainable lifestyle practices cannot work separately.

CONCLUSION

The current research revealed climate change awareness, eco-friendly social norms, and green self-efficacy to be crucial elements affecting people's sustainability behavior. The results of the analysis indicated that greater awareness of climate change positively affected environmentally responsible behavior, yet it was more influential in the presence of one's belief in his or her capacity to perform a particular activity. In addition, eco-friendly social norms encouraged individuals to practice sustainable lifestyles through promoting green behavior as accepted, normative, and observable. The development of green self-efficacy proved to be crucial from a psychological point of view since it contributed to putting the elements of awareness and social influence into action, allowing people to save electricity, consume less plastic, recycle, make responsible purchases, and choose environment-friendly modes of transportation.

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