

Emotion Regulation Difficulties and Perceived Stress among Daily-Smoking and Non-Smoking Gym-Goers in India: A Comparative Correlational Study

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Regular physical activity is widely recognized for enhancing emotional well-being, yet lifestyle factors such as smoking may reduce these benefits. This study aimed to compare emotion regulation difficulties and perceived stress between daily-smoking and non-smoking gym-goers, and to examine the relationship between these variables within each group. A total of 120 gym-goers aged 20–35 years (60 smokers, 60 non-smokers) from Uttar Pradesh were recruited using convenience sampling and completed the Difficulties in Emotion Regulation Scale (DERS) and the Perceived Stress Scale (PSS). Independent samples t-tests revealed that smokers reported significantly higher emotional dysregulation ($M = 97.6$, $SD = 14.3$) and perceived stress ($M = 23.8$, $SD = 5.2$) compared to non-smokers ($M = 82.1$, $SD = 12.8$; $M = 18.7$, $SD = 4.9$). Pearson correlations showed significant positive associations between emotion regulation difficulties and perceived stress in both groups, with a stronger relationship among smokers ($r = .62$, $p < .001$) than non-smokers ($r = .41$, $p < .01$). These findings suggest that smoking may undermine the psychological benefits of exercise by increasing emotional dysregulation and stress among gym-goers, highlighting the need for integrated interventions combining smoking cessation, emotion regulation training, and physical activity promotion to support mental health in this population.

Keywords: Physical activity, lifestyle factors, emotional dysregulation

Regular physical activity is prominently considered as a robust contributor to physical and psychological well-being. Exercise has been demonstrated to improve mood, lessen depressive and anxious symptoms, and strengthen overall emotional resilience (Biddle & Asare, 2011; Rebar et al., 2015). Gym attendance among young adults has grown in popularity, indicating a rising understanding of holistic health as well as a commitment to physical fitness. Even while exercise has many advantages, certain lifestyle choices, like smoking, may offset the psychological benefits of physical activity.

Gross (1998) defined emotion regulation as the process through which individuals monitor, evaluate, and modify their emotional reactions to achieve adaptive outcomes. Effective emotion regulation requires maintaining behavioural control, managing the intensity and duration of emotions, and using adaptive strategies like cognitive reappraisal or problem-solving. However, characteristics of emotion regulation issues include impulsivity, avoidance, emotional suppression, and an incapacity to handle negative affect (Gratz & Roemer, 2004). Research indicates that poor

emotion regulation is closely associated with psychopathology, maladaptive coping methods, and substance use, including smoking (Aldao et al., 2010; Berking et al., 2011).

According to Lazarus and Folkman (1984), psychological stress is characterized by a person's belief that the demands of their surroundings are beyond their ability to cope. Poor mental and physical health consequences, such as cardiovascular disease, depression, and compromised immunological function, are associated with high levels of stress (Cohen et al., 2007). Frequent exercise protects against stress and increases resilience through psychological and physiological mechanisms, such as enhanced self-efficacy and cognitive appraisal of challenges, as well as modulation of the hypothalamic-pituitary-adrenal axis (Salmon, 2001; Kandola et al., 2019).

According to the Global Adult Tobacco Survey (2016–17), cigarette smoking is still a major public health concern in India, with prevalence rates especially high among young adults between the ages of 18 and 35. Smokers frequently claim to use nicotine as a coping mechanism for psychological stress and unpleasant feelings. According to the self-medication theory, people take drugs like nicotine to control their emotions and momentarily ease their discomfort (Khantzian, 1997). According to Parrott (1999) and McLaughlin et al. (2015), smoking repeatedly leads to emotional dysregulation, which increases vulnerability to stress and anxiety over time, even while nicotine may offer temporary relief from unpleasant effect.

The relationship between physical activity and other lifestyle choices, including smoking, is still poorly understood, despite the fact that exercise is generally helpful for reducing stress. Because nicotine affects neurobiological systems involved in emotion

regulation and stress response, smokers may still have high levels of stress even when they exercise regularly (Gilbert et al., 2014).

A population with high levels of physical activity is represented by gym-goers, however some members of this group nevertheless smoke on a daily basis. This contrast offers a chance to investigate how smoking and exercise combine to affect stress and emotional control. Previous studies show that smokers have weaker emotional regulation and more reported stress than non-smokers, even in physically active groups (McDermott et al., 2015; Audrain-McGovern & Benowitz, 2011). These results emphasize a complex relationship between lifestyle factors and psychological well-being, suggesting that smoking may lessen the emotional advantages of exercise.

Few studies have explicitly looked at the relationship between smoking behaviour and gym-based exercise in Indian communities, despite the wealth of research on the advantages of exercise for stress reduction and emotional regulation. This study is significant for a number of reasons. It first addresses the existing gap in the knowledge about how exercise and smoking together affect emotional outcomes in urban Indian populations. Second, by emphasizing the need for integrated strategies that address both physical and mental health habits, the results can guide intervention programs in gyms and fitness facilities. Lastly, comprehending these processes supports more comprehensive public health initiatives that seek to lower the prevalence of smoking and improve young adults' emotional resilience. Targeted programs that integrate exercise promotion with smoking cessation and mental health measures can be informed by knowledge of how daily smoking impacts stress and emotion regulation among gym-goers.

Furthermore, it is crucial to evaluate the behavioural and subjective components of emotion regulation in this population. A thorough evaluation of emotional dysregulation and stress perception is made possible by the use of validated scales like the Perceived Stress Scale (PSS) and the Difficulties in Emotion Regulation Scale (DERS), which give clinicians, fitness instructors, and public health professionals useful information.

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Research Objectives

The primary objective of this study was to examine the association between emotion regulation and psychological stress among gym-goers who smoke daily and those who do not in Delhi and Uttar Pradesh. Specifically, the study aimed to:

1. To examine the emotion regulation difficulties between daily-smoking and non-smoking gym-goers.

2. To examine perceived stress levels between these two groups.
3. To examine the relationship between emotion regulation difficulties and perceived stress within each group.

Hypotheses

Based on existing literature, the study proposed the following hypotheses:

- H1: Daily-smoking gym-goers will exhibit significantly greater difficulties in emotion regulation compared to non-smoking gym-goers.
- H2: Daily-smoking gym-goers will report higher levels of perceived psychological stress than non-smoking gym-goers.
- H3: Emotion regulation difficulties will be positively associated with perceived stress in both groups, with a stronger association among smokers.

Significance of the Study

There are several reasons which makes this research significant. It first fills a vacuum in the knowledge about how exercise and smoking together affect emotional outcomes in urban Indian populations. Second, by emphasizing the need for integrated strategies that address both physical and mental health habits, the results can guide intervention programs in gyms and fitness facilities. Lastly, comprehending these processes supports more comprehensive public health initiatives that seek to lower the prevalence of smoking and improve young adults' emotional resilience.

Method

Participants

A total of 120 gym-goers aged 20–35 years were recruited from Uttar Pradesh, India. Participants were classified into two groups: daily smokers (n = 60) and non-

smokers (n = 60). Convenience sampling was used to recruit participants by direct invitations at urban fitness centers, social media, and gym posters. Participants were guaranteed confidentiality and gave their informed consent before beginning.

Inclusion criteria:

- Regular gym attendance (e”3 sessions per week) for at least six months.
- Age between 20–35 years.
- No current diagnosis of psychiatric disorders (e.g., depression, anxiety disorder) confirmed via self-report screening.
- For smokers: at least one cigarette per day for the past six months.

Exclusion criteria:

- Use of other psychoactive substances (e.g., alcohol dependence, recreational drugs).
- Recent major life events causing extreme stress (e.g., bereavement, job loss) to avoid confounding acute stress.

The sample comprised 68 males (56.7%) and 52 females (43.3%), with similar gender distribution across smoker and non-smoker groups. Mean age of participants was 26.4 years (SD = 3.8) for smokers and 25.9 years (SD = 4.1) for non-smokers.

Measures:

1. *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004): The DERS is a 36-item self-report instrument assessing six facets of emotion regulation: nonacceptance, goals, impulse, awareness, strategies, and clarity. A 5-point Likert scale (1 = Almost Never, 5 = Almost Always) is used to grade responses; higher scores indicate more difficulty regulating emotions. Previous

investigations have shown that the scale has good internal consistency ($\alpha = .89-.93$). Cronbach’s α for this sample was .91.

2. *Perceived Stress Scale* (PSS; Cohen et al., 1983): The PSS is a 10-item self-report scale measuring perceived stress over the past month. Items are rated on a 5-point Likert scale (0 = Never, 4 = Very Often), with higher scores indicating greater perceived stress. Cronbach’s α in this study was .84.

Research Design

The present study adopted a comparative correlational research design to examine differences and associations between emotion regulation and psychological stress among gym-goers who smoke daily and those who do not. The design was non-experimental in nature, using a quantitative, cross-sectional survey method. This approach allowed for the comparison of two distinct groups (daily smokers and non-smokers) and for assessing the relationship between two key psychological constructs—emotion regulation and perceived stress—within each group.

Procedure

After a brief explanation of the test, each participant gave their informed consent. They were requested to complete the sociodemographic form. The participants completed the PSS and DERS. Participants were told that their answers would remain anonymous and were asked to provide truthful answers. The questionnaires took an average of 15 to 20 minutes to complete.

Descriptive statistics (mean, standard deviation, and range) were computed for all major variables. Prior to analysis, data were screened for normality, outliers, and missing values. Skewness and kurtosis values were within acceptable ranges (± 2), suggesting normal distribution.

To address the first two research objectives, independent samples t-tests were

conducted to compare daily-smoking and non-smoking gym-goers on their scores of emotion regulation (DERS) and perceived stress (PSS). The significance level was set at $p < .05$ (two-tailed). Cohen's d was computed to determine the magnitude of group differences, with values of 0.2, 0.5, and 0.8 representing small, medium, and large effects, respectively (Cohen, 1988).

For the third objective, Pearson product-moment correlation coefficients were calculated separately for each group to examine the relationship between emotion regulation difficulties and perceived stress. Correlation strength was interpreted following Cohen's (1988) guidelines: $r = .10$ (small), $r = .30$ (moderate), and $r = .50$ (large). Additionally, Fisher's z transformation was applied to compare correlation coefficients between the two groups to determine whether the strength of the relationship

significantly differed between smokers and non-smokers.

All analyses were two-tailed, and confidence intervals (95%) were reported where applicable. Findings were tabulated and interpreted in light of existing literature on smoking behaviour, emotional regulation, and stress coping mechanisms among physically active populations.

Results

Descriptive Statistics

The daily-smoking gym-goers reported higher DERS scores ($M = 97.6$, $SD = 14.3$) compared to non-smoking gym-goers ($M = 82.1$, $SD = 12.8$). Similarly, perceived stress was greater in the smoker group ($PSS M = 23.8$, $SD = 5.2$) than the non-smoker group ($PSS M = 18.7$, $SD = 4.9$). Table 1 summarizes the descriptive statistics.

Table 1. Descriptive Statistics for DERS and PSS Scores

Measures	Smokers(n=60)	Non-Smokers (n=60)	t	p	Cohen'd
DERS	97.6 ± 14.3	82.1 ± 12.8	6.15	<.001	1.08
PSS	23.8 ± 5.2	18.7 ± 4.9	5.47	<.001	0.96

Table 2. Correlation between DERS and PSS among Smokers and Non-Smokers

Group	DERS-PSS r	p
Smokers (n = 60)	.62	<.001
Non-Smokers (n = 60)	.41	<.01

Table 1 shows the descriptive analysis indicating mean DERS scores for smokers and non-smokers were 97.6 ($SD = 14.3$) and 82.1 ($SD = 12.8$), respectively. The corresponding PSS averages were 18.7 ($SD = 4.9$) and 23.8 ($SD = 5.2$). Independent samples t -tests were conducted to compare emotional dysregulation and perceived stress between smokers and non-smokers. Results showed a significant difference in DERS scores, with smokers ($M = 97.6$, $SD =$

14.3) demonstrating substantially higher emotional dysregulation than non-smokers ($M = 82.1$, $SD = 12.8$), $t(118) = 6.15$, $p < .001$, indicating a large effect size (Cohen's $d = 1.08$).

Similarly, there was a significant difference in perceived stress (PSS) scores, with smokers ($M = 23.8$, $SD = 5.2$) scoring higher on perceived stress compared to non-smokers ($M = 18.7$, $SD = 4.9$), $t(118) = 5.47$, $p < .001$, also reflecting a large effect size (Cohen's $d = 0.97$). These results suggest that smokers exhibit significantly greater emotional dysregulation and perceived stress than non-smokers.

Separate correlation analyses were performed for smokers and non-smokers to investigate the relationship between felt

stress and problems regulating emotions. Table 2 shows the correlation analysis for DERS and PSS among smokers and non-smokers gym goers. The two measures showed a substantial and significant positive connection among smokers ($r(58) = .62, p < .001$), suggesting that higher levels of emotional dysregulation were linked to higher levels of perceived stress. $R(58) = .41, p < .01$, indicates a moderate but significant connection among non-smokers. These results imply that perceived stress and emotion control issues are associated in both groups, although the relationship is more pronounced among smokers. These results imply that poor emotion control, especially in smokers, is a predictor of increased stress.

Discussion

The present study examined the relationship between psychological stress and emotion control in gym patrons who smoke regularly and those who do not from Uttar Pradesh, India. Daily smokers reported considerably more challenges with emotion regulation and perceived stress than non-smokers, which is consistent with the study's predictions. Additionally, both groups showed a favourable association between perceived stress and emotion regulation problems, with smokers showing a higher correlation. These results demonstrate the intricate relationship between exercise, lifestyle choices, and psychological functioning.

Regular smokers in the gym had significantly more trouble controlling their emotions than non-smokers. According to earlier studies (McDermott et al., 2015; Gilbert et al., 2014), nicotine dependency can interfere with impulse control and affective regulation. According to the self-medication hypothesis, nicotine usage may first function as a coping strategy for unpleasant feelings (Khantzian, 1997). However, long-term usage can result in emotional dysregulation because cravings, withdrawal symptoms, and brain

changes increase susceptibility to stress (Parrott, 1999; McLaughlin et al., 2015).

Although exercise is typically good for emotional functioning, these negative consequences could not be entirely mitigated. Even if they regularly frequent the gym, smokers may still have problems with cognitive control, increased impulsivity, and elevated negative affect. This implies that the emotional effects of nicotine dependency may not be sufficiently mitigated by exercise alone.

According to earlier research, long-term nicotine use is linked to increased physiological and psychological stress reactions (Cohen et al., 2007; Audrain-McGovern & Benowitz, 2011). Smokers reported far higher felt stress than non-smokers. The stress-relieving benefits of exercise seem to be lessened in the context of daily smoking, even though gym-goers often have increased stress resilience due to physical activity. This lends credence to the idea that smoking creates a paradoxical stress cycle in which withdrawal and dependency lead to higher baseline stress levels while nicotine offers momentary relief (Parrott, 1999).

Emotional dysregulation is linked to elevated stress perception, as seen by the positive association between DERS scores and experienced stress in both groups. The higher correlation in smokers suggests that people who use unhealthy coping mechanisms, such as smoking nicotine, may feel more stress due to emotional dysregulation. The necessity for combined therapies that focus on smoking cessation and emotion management skills in physically active populations is highlighted by this finding.

The findings corroborate Gross's process model of emotion regulation, emphasizing that stress management requires the capacity to track, regulate, and react to emotions in an

adaptive manner (Gross, 1998). The increased emotion regulation issues that smokers experience point to deficiencies in a number of areas, such as impulse control, emotional awareness, and the application of adaptive strategies. Maladaptive emotional reactions may result from these deficiencies interacting with neurobiological circuits modified by long-term nicotine use, especially in the prefrontal cortex and amygdala (Gilbert et al., 2014).

The results further support the self-medication hypothesis, which states that although smoking may momentarily reduce negative emotions, it eventually increases vulnerabilities associated to stress and emotions (Khantzian, 1997). This connection is especially significant in gym-going people because exercise is thought to improve emotional resilience; smokers' higher levels of stress suggest that smoking may outweigh these advantages.

The study offers several practical implications, limitations, and directions for future research. In terms of practical applications, exercise-based interventions should not only focus on physical activity but also integrate stress management workshops and emotion regulation training for smokers. Techniques like mindfulness, cognitive reappraisal, and acceptance-based strategies can improve emotional control (Berking et al., 2011). Combining smoking cessation programs with fitness initiatives can yield dual benefits by reducing nicotine-related emotional dysregulation and enhancing the stress-buffering effects of exercise. Moreover, gyms can act as public health platforms, promoting physical activity, mental health education, and anti-smoking awareness among young adults. However, the study has limitations. Its cross-sectional design restricts causal interpretation, and self-reported measures such as DERS and PSS are prone to social desirability and recall bias. Future studies could employ

physiological indicators like cortisol to increase validity. Additionally, the urban sample limits generalizability to rural or international populations, and confounding variables such as diet, sleep quality, and socioeconomic status were not controlled. To advance the field, future research should employ longitudinal designs to track gym-goers over time, test integrated interventions combining exercise, emotion regulation, and smoking cessation, and incorporate physiological biomarkers like heart rate variability and cortisol for objective stress assessment. Cross-cultural comparisons across different regions of India and internationally could also reveal how cultural factors influence emotion regulation, stress, and smoking behaviour.

References

- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*(2), 217–237. <https://doi.org/10.1016/j.cpr.2009.11.004>
- Audrain-McGovern, J., & Benowitz, N. L. (2011). Cigarette smoking, nicotine, and body weight. *Clinical Pharmacology & Therapeutics, 90*(1), 164–168. <https://doi.org/10.1038/clpt.2011.102>
- Audrain-McGovern, J., Rodriguez, D., & Epstein, L. H. (2011). The relationship between physical activity, smoking, and weight regulation. *Addictive Behaviors, 36*(4), 386–390. <https://doi.org/10.1016/j.addbeh.2010.12.008>
- Berking, M., Wupperman, P., Reichardt, A., Pejic, T., Dippel, A., & Znoj, H. (2011). Emotion-regulation skills as a treatment target in psychotherapy. *Behaviour Research and Therapy, 49*(11), 754–759. <https://doi.org/10.1016/j.brat.2011.08.003>
- Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine, 45*(11), 886–895. <https://doi.org/10.1136/bjsports-2011-090185>

- Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *JAMA*, *298*(14), 1685–1687. <https://doi.org/10.1001/jama.298.14.1685>
- Gilbert, D. G. (2009). Cognitive and emotional aspects of nicotine use: Behavioral neuroscience perspectives. *Current Directions in Psychological Science*, *18*(6), 356–360. <https://doi.org/10.1111/j.1467-8721.2009.01663.x>
- Gilbert, D. G., McClernon, F. J., Rabinovich, N. E., Sugai, C., Plath, L. C., Asgaard, G., & Botros, N. (2014). Effects of nicotine on affective processing and cognition. *Psychopharmacology*, *231*(3), 523–536. <https://doi.org/10.1007/s00213-013-3266-5>
- Global Adult Tobacco Survey. (2016–17). *India report*. Ministry of Health and Family Welfare, Government of India. <https://www.who.int/teams/noncommunicable-diseases/surveillance/data/global-adult-tobacco-survey>
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation. *Journal of Psychopathology and Behavioral Assessment*, *26*, 41–54. <https://doi.org/10.1023/B:JOBA.0000007455.08539.94>
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271–299. <https://doi.org/10.1037/1089-2680.2.3.271>
- Hagger, M. S., & Chatzisarantis, N. L. D. (2009). Integrating the theory of planned behavior and self-determination theory in health behavior research. *British Journal of Health Psychology*, *14*(2), 275–292. <https://doi.org/10.1348/135910708X373959>
- Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology*, *1*, 293–319. <https://doi.org/10.1146/annurev.clinpsy.1.102803.143938>
- Kandola, A., Ashdown-Franks, G., Hendrikse, J., Sabiston, C. M., & Stubbs, B. (2019). Physical activity and depression: Towards understanding the antidepressant mechanisms of physical activity. *Neuroscience & Biobehavioral Reviews*, *107*, 525–539. <https://doi.org/10.1016/j.neubiorev.2019.09.040>
- Khantzian, E. J. (1997). The self-medication hypothesis of substance use disorders: A reconsideration and recent applications. *Harvard Review of Psychiatry*, *4*(5), 231–244. <https://doi.org/10.3109/10673229709030550>
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, *33*(6), 763–771. <https://doi.org/10.1016/j.cpr.2013.05.005>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer. <https://doi.org/10.1007/978-1-4419-1005-9>
- McDermott, M. S., Marteau, T. M., Hollands, G. J., Hankins, M., & Aveyard, P. (2015). Changes in cognitive and emotional responses to smoking in the context of physical activity. *Health Psychology*, *34*(6), 583–591. <https://doi.org/10.1037/hea0000180>
- McLaughlin, K. A., Hatzenbuehler, M. L., Mennin, D., & Nolen-Hoeksema, S. (2015). Emotion dysregulation and psychopathology: A transdiagnostic approach. *Annual Review of Clinical Psychology*, *11*, 379–405. <https://doi.org/10.1146/annurev-clinpsy-032814-112739>
- Mikkelsen, K., Stojanovska, L., Polenakovic, M., Bosevski, M., & Apostolopoulos, V. (2017). Exercise and mental health. *Maturitas*, *106*, 48–56. <https://doi.org/10.1016/j.maturitas.2017.09.003>
- Parrott, A. C. (1999). Does cigarette smoking cause stress? *American Psychologist*, *54*(10), 817–820. <https://doi.org/10.1037/0003-066X.54.10.817>
- Rebar, A. L., Stanton, R., Geard, D., Short, C., Duncan, M. J., & Vandelanotte, C. (2015). A meta-meta-analysis of the effect of physical activity on depression and anxiety in non-clinical populations. *Health*

Psychology Review, 9(3), 366–378. <https://doi.org/10.1080/17437199.2015.1022901>

Salmon, P. (2001). Effects of physical exercise on anxiety, depression, and sensitivity to stress: A unifying theory. *Clinical Psychology Review*, 21(1), 33–61. [https://doi.org/10.1016/S0272-7358\(99\)00032-X](https://doi.org/10.1016/S0272-7358(99)00032-X)

Wills, T. A., & Shiffman, S. (1985). Coping and substance use: A conceptual framework.

Coping and Substance Use, 3–24. https://doi.org/10.1007/978-1-4612-5174-1_1.

Zvolensky, M. J., Bernstein, A., & Vujanovic, A. A. (2011). Distress tolerance: Theory, measurement, and relations to psychopathology. *Current Directions in Psychological Science*, 20(2), 112–116. <https://doi.org/10.1177/0963721411402482>.

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