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Investigating Health-Promoting Lifestyle Factors and Demographic Impacts Among Collegiate Flight Students

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Collegiate flight students face unique physiological and psychological challenges in maintaining a balanced and health-promoting lifestyle due to the simultaneous pressures of academic coursework and intensive flight training. This study investigated the interrelationships among six dimensions of a health-promoting lifestyle, health responsibility, physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management. A quantitative, non-experimental survey design was utilized with the validated Health-Promoting Lifestyle Profile II (HPLP II) instrument. Data was collected from 191 collegiate flight students enrolled in Federal Aviation Administration (FAA) Part 141 programs across the United States. Findings indicated a moderately healthy overall lifestyle score ($M = 2.64$, $SD = 0.39$), with significant positive correlations among all six lifestyle categories. No statistically significant differences were found between genders or among different flight certification levels. Results suggest that health behaviors among collegiate flight students are interdependent, with stress management, interpersonal relationships, and spiritual growth demonstrating the strongest associations with overall wellness. These findings provide actionable implications for aviation training programs and policymakers to enhance collegiate flight student well-being, optimize performance, and promote a stronger safety culture in flight training operations.

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Introduction and Background

Collegiate flight students experience distinctive challenges in sustaining healthy lifestyle practices as they manage the concurrent demands of rigorous academic coursework and intensive flight training schedules. The result is a population that is particularly vulnerable to fatigue, nutritional imbalance, stress, and limited sleep quality. These challenges mirror many of those experienced by professional airline pilots, who often report higher incidences of fatigue, sedentary behavior, and poor diet due to irregular schedules and operational demands (Minoretti & Emanuele, 2023; Venus & Holtforth, 2022). While considerable literature exists on the general health behaviors of college students (e.g., American College Health Association [ACHA], 2022; Huang & Liu, 2020) and on occupational health risks faced by commercial pilots (Wilson et al., 2023), there remains a research gap in understanding how collegiate flight students manage their wellness. The collegiate flight student population represents a transition phase between higher education and the professional aviation industry, and their lifestyle patterns may have long-term implications for safety and performance in future airline careers.

A health-promoting lifestyle is defined as a multidimensional approach to personal well-being encompassing six domains: health responsibility, physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management (Walker et al., 1995). Prior studies have shown that maintaining positive behaviors in one domain often enhances outcomes in others (Phulkerd et al., 2021; Al-Qahtani, 2019). For example, regular exercise contributes to stress reduction and improved interpersonal relationships, while spiritual growth and social support enhance resilience under pressure (Amiri et al., 2019). Conversely, neglecting these dimensions can have cascading effects, leading to fatigue, reduced concentration, and psychological strain, critical factors that impair pilot performance and decision-making (Clarke et al., 2024).

Given the aviation industry's sustained emphasis on safety, performance, and human factors, understanding the lifestyle behaviors of collegiate flight students is essential for both educational and operational contexts. The health and well-being of student pilots directly influence their cognitive performance, stress management, and overall readiness to meet the physical and psychological demands of flight operations. Identifying patterns in lifestyle choices can help educators, training institutions, and regulators develop evidence-based interventions that foster safer and more sustainable professional practices. Accordingly, this research investigates two key areas: (a) the relationships among the six dimensions of a health-promoting lifestyle and (b) the extent to which demographic factors, specifically gender and flight experience, may influence these behaviors within the collegiate aviation population.

Methodology

Research Design

This study utilized a quantitative, non-experimental survey design using the Health-Promoting Lifestyle Profile II (HPLP II) developed by Walker et al. (1995). The survey instrument consisted of 52 items on a 4-point Likert scale (1 = Never, 2= Rarely, 3 = Sometimes, 4 = Often), measuring the frequency of engagement in health-promoting behaviors across the six

lifestyle dimensions. The HPLP II has demonstrated high internal consistency and construct validity in multiple populations (Cronbach's α = .78–.84; Tanjani et al., 2016). The survey also collected demographic data, including gender, age, academic level, and flight certification. Flight experience was measured ordinally by the highest certification attained (e.g., Student, Private, Instrument, Commercial Single-Engine, Commercial Multi-Engine, and CFI/CFI-I).

Participants and Data Collection Procedures

Participants in this study consisted of 191 collegiate flight students enrolled in FAA Part 141 flight training programs at six universities across the U.S. Eligibility criteria required participants to be at least 18 years of age and actively involved in flight training within the preceding six months. Following Institutional Review Board (IRB) approval, the survey was distributed online via Microsoft Forms®. Faculty and department chairs at participating institutions were invited to encourage participation in the study and share the survey link among their students. A non-random convenience sampling approach was utilized to recruit participants and collect data.

Statistical Analysis

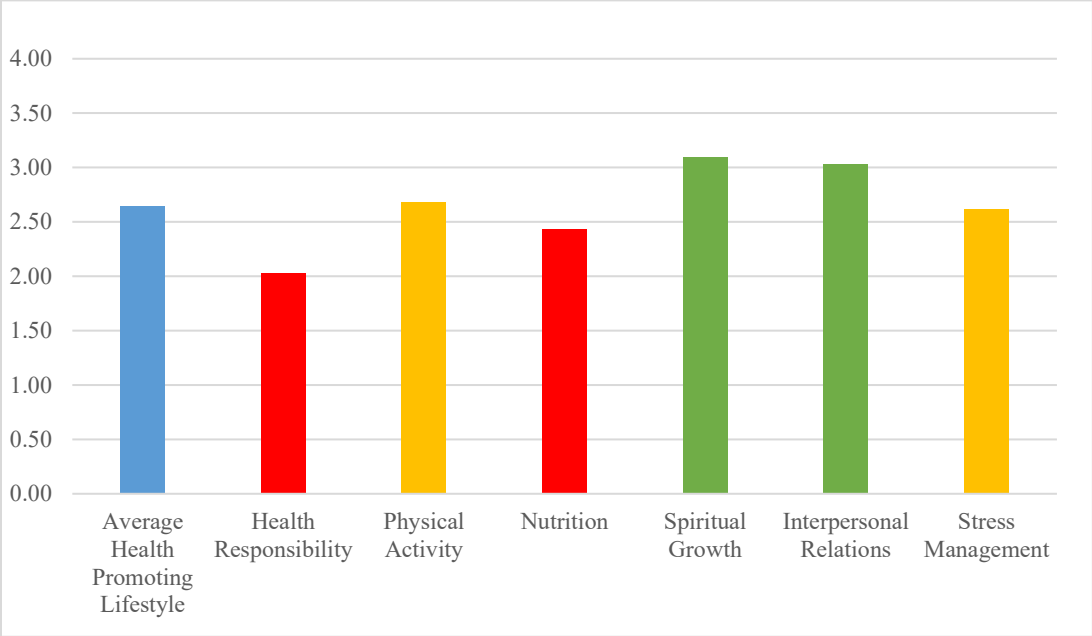
Descriptive statistics were computed to summarize demographic distributions and mean HPLP II scores. To test relationships among lifestyle domains, two-tailed Pearson correlation analyses were conducted. One-way ANOVA tested for differences by flight certification, and independent-samples t-tests evaluated gender-based differences. Statistical significance was set at $p < .05$. Analyses were conducted using IBM Statistical Package for Social Sciences (SPSS).

Results

Descriptive Statistics

Of the 198 responses received, 191 were valid and included in the analysis (Male: n = 137; Female: n = 52; Prefer not to say: n = 2). The majority of participants were aged 18–21 (82%), with most students enrolled as sophomores (31%) or juniors (27%). Flight experience ranged from student pilot to certified flight instructor (CFI/CFII). The overall mean HPLP II score was 2.64 (SD = 0.39), indicating a moderately healthy lifestyle. Among the six categories, health responsibility (M = 2.03) and nutrition (M = 2.42) scored below the moderate threshold (between 2.5 and 3), while spiritual growth (M = 3.09), interpersonal relationships (M = 3.03), and physical activity (M = 2.68) showed healthier patterns. Figure 1 presents the mean scores across categories.

Figure 1
Mean Health-Promoting Lifestyle Scores by Category

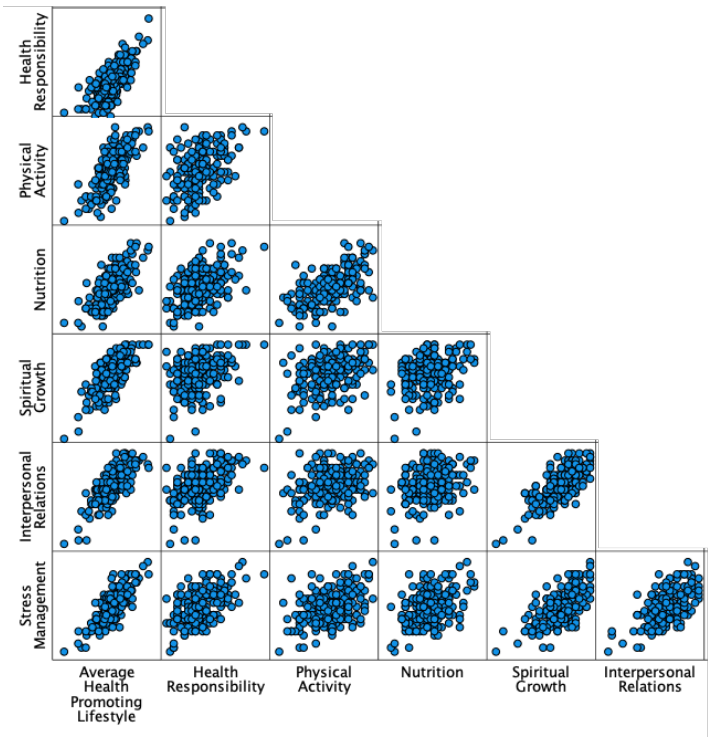


Correlations Among Lifestyle Categories

Pearson's correlations indicated significant positive relationships among all six lifestyle categories and the overall HPLP II score ($p < .001$). Large-effect correlations were observed between stress management and overall lifestyle ($r = .808$), spiritual growth and overall lifestyle ($r = .751$), and interpersonal relationships and overall lifestyle ($r = .759$). These findings suggest that students who engage more frequently in one health-promoting behavior similarly tend to engage more frequently in others. The scatterplot matrix (Figure 2) illustrates these interrelationships.

Figure 2

Scatterplot Matrix of Relationships Between Lifestyle Categories



Demographic Analyses

A one-way ANOVA revealed no significant differences in overall lifestyle scores among students with varying flight certifications, $F(6, 191) = 0.50$, $p = .775$. Likewise, an independent-samples t-test indicated no gender differences in overall HPLP II scores (male: $M = 2.65$, female: $M = 2.65$; $t(187) = –0.05$, $p = .964$). These results suggest that gender and flight experience exert limited influence on the extent to which flight students engage in health-promoting behaviors.

Discussion

Interconnected Lifestyle Behaviors

The significant correlations among all health-promoting lifestyle categories reinforce the idea that wellness behaviors function as a system rather than as isolated actions. Improvements in one area can positively influence others, consistent with prior findings from Amiri et al. (2019) and Phulkerd et al. (2021). The particularly strong association between stress management and overall lifestyle implies that coping strategies and emotional regulation play a central role in maintaining well-being during flight training. Effective stress management may enable students to make healthier nutritional choices, engage in physical activity, and foster stronger interpersonal relationships.

Role of Health Responsibility and Nutrition

Health responsibility and nutrition were the lowest-scoring domains, which aligns with previous findings among college populations (ACHA, 2022; Huang & Liu, 2020). Flight students may prioritize operational training and academic performance over personal health maintenance due to time constraints, financial pressures, or lack of institutional support. This behavior could have long-term safety implications, as neglecting nutrition, rest, or exercise may compromise cognitive performance and reaction time in aviation settings. Structured health-education programs integrated into flight curricula could enhance awareness and self-management among students.

Gender and Experience Effects

Although previous studies have found gender differences in health behaviors, often with females reporting higher wellness engagement (Baum et al., 2021; Pop et al., 2021), this study found no significant gender effect. One explanation may be the highly standardized and regimented nature of flight training, which imposes similar routines, schedules, and behavioral expectations across all participants regardless of gender. Similarly, no significant differences emerged by flight certification level, suggesting that as students progress in training, they may not substantially alter their lifestyle behaviors. Instead, wellness habits may develop early in training, indicating a potential for early intervention in freshman or sophomore years.

Implications for Aviation Education and Safety

The findings have practical implications for aviation safety management systems (SMS) and collegiate flight program design. Institutions can enhance training outcomes by promoting wellness initiatives that target nutrition, stress management, and physical activity. Faculty and administrators might incorporate regular health check-ins, fatigue management modules, and mentorship programs emphasizing lifestyle balance. A stronger focus on mental and physical well-being can directly influence flight performance, reduce attrition rates, and foster safer future professionals.

Conclusion and Future Research

This study provides empirical evidence of significant interrelationships among the six domains of a health-promoting lifestyle in collegiate flight students. Although overall lifestyle scores were moderately healthy, deficits in nutrition and health responsibility highlight areas for institutional intervention. Future research should expand the sample to include international flight students, examine longitudinal lifestyle changes across training phases, and explore the influence of environmental and institutional factors. Integrating quantitative and qualitative approaches could yield deeper insight into behavioral motivations and barriers to healthy lifestyle habits in aviation education.

References

American College Health Association. (2022). *American College Health Association–National College Health Assessment III: Undergraduate Student Reference Group Executive Summary Spring 2022.* https://www.acha.org/wp-content/uploads/2024/07/NCHA-III_SPRING_2022_UNDERGRAD_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf

Al-Qahtani, M. F. (2019). Comparison of health-promoting lifestyle behaviours between female students majoring in healthcare and non-healthcare fields in KSA. *Journal of Taibah University Medical Sciences, 14*(6), 508–514. https://doi.org/10.1016/j.jtumed.2019.10.004

Amiri, M., Ehsani, M., & Norozi, E. (2019). Lifestyle behaviors and well-being among university students. *Health Promotion Perspectives, 9*(4), 302–309. https://doi.org/10.24171/j.phrp.2019.10.4.04

Baum, S., Fitzgerald, L., & Costa, S. (2021). Gender differences in health responsibility and outcomes. *Journal of Health Psychology, 26*(9), 1502–1513. https://doi.org/10.3390/ijerph18020661

Clarke, F. A., Mendonça, F. A. C., & García, K. (2024). Mental health and fatigue among collegiate flight students. *Journal of Aviation Education and Research, 34*(1), 55–70. https://doi.org/10.22488/okstate.24.100230

Huang, Y., & Liu, C. (2020). Dietary habits and social influences on healthy eating in college populations. *Nutrition Research and Practice, 14*(3), 243–251. https://doi.org/10.1080/15428052.2020.1777921

Minoretti, P., & Emanuele, E. (2023). Lifestyle risk factors among professional pilots: A review. *Aerospace Medicine and Human Performance, 94*(2), 90–98. https://doi.org/10.7759/cureus.38000

Phulkerd, S., Vongmongkol, V., Saranrittichai, K., & Aekplakorn, W. (2021). Healthy lifestyle and life satisfaction among Thai adults. *Public Health Nutrition, 24*(10), 3174–3182. https://doi.org/10.1186/s12889-020-10032-9

Pop, C., Budesa, T., & Harris, L. (2021). Gender, health perception, and lifestyle awareness among adults. *BMC Psychology, 9*(1), 119. https://doi.org/10.3390/medicina57070648

Tanjani, P. T., Azadbakht, M., Garmaroudi, G., Sahaf, R., & Fekrizadeh, Z. (2016). Validity and reliability of the Health Promoting Lifestyle Profile II in the Iranian elderly. *International Journal of Preventive Medicine, 7*, 74. https://doi.org/10.4103/2008-7802.182731

Venus, M., & Holtforth, M. G. (2022). Interactions of international pilots' stress, fatigue, symptoms of depression, anxiety, common mental disorders, and well-being.

International Journal of Aviation, Aeronautics, and Aerospace, 9(1). https://doi.org/10.15394/ijaaa.2022.1667

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1995). *Health promotion model – Instruments to measure health-promoting lifestyle: Health-Promoting Lifestyle Profile [HPLP II] (adult version).* University of Michigan Deep Blue Repository. https://deepblue.lib.umich.edu/handle/2027.42/85349

Wilson, D., Driller, M., Johnston, B., & Gill, N. (2023). Healthy nutrition, physical activity, and sleep hygiene to promote cardiometabolic health of airline pilots: A narrative review. *Journal of Lifestyle Medicine, 13*(1), 1–15. https://doi.org/10.15280/jlm.2023.13.1.1